Madden & Mud 46

AMERICAN

RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, *Editor.*

ASSISTANT EDITORS:

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CHARLES T. JAMES, *For Manufactures and the Mechanic Arts.*
M. BUTT HEWSON, *For Civil Engineering.*

SATURDAY, APRIL 6, 1850.

Second Quarto Series, Vol. VI., No. 14.---Whole No. 729, Vol. XXIII.

ESTABLISHED IN 1831.

NEW-YORK:

PUBLISHED WEEKLY, BY

JOHN H. SCHULTZ & CO.

Room 12, Third Floor,

No. 136 Nassau Street.

FARMERS! ATTENTION!!

John Mayher & Co's

NEW AGRICULTURAL WAREHOUSE AND SEED STORE,

197 WATER STREET, NEW YORK.

Where they have for Sale, the largest and most complete assortment of Farming Implements, ever offered for sale in this city—all of which they will sell 10 per cent. Cheaper than the same kind of Goods can be bought at any other house in the city. Our Goods are all Warranted to give satisfaction.

FARMERS wanting to purchase, will please call and examine our *Stock* before buying elsewhere.

Among our assortment may be found the Celebrated Highest Premium Eagle Ploughs! together with all the most approved Ploughs now in use.

Also,—Horse Powers, Threshing Machines, Fan Mills, Corn Shellers, Straw Cutters, Corn Mills, Seed Sowers, Churns, Ox Yokes, Ox Scrapers, Hay Rakes, Horse Rakes, Patent Chain Pump (that never freezes nor rusts), and other Pumps; in fact we have everything for Farming Purposes—together with Guano, Bone Dust and other Fertilizers.

JOHN MAYHER & CO.,
197 Water st., N. Y.

February 9, 1850.

N.B.—J. M. & Co. also continue their Old Stand, at 195 Front street, near Fulton Market.

STABILITY—SECURITY—PERPETUITY.

Mutual Life Insurance Co. of New York.

No. 35 WALL STREET,

A MILLION OF DOLLARS

Securely invested in Bonds and Mortgages on real estate in this city and Brooklyn, and stocks of the State and City of New York and United States Government.

This fund is rapidly increasing, by a widely extended and prosperous business.

The company declared a dividend of profits of fifty-two per cent. on all existing policies on the 31st of January, 1848.

All the Profits are Divided Among the Insured.

The premiums are payable in Cash annually, semi-annually, or quarterly, interest being added on the deferred payments.

The cash principle adopted by this company secures to the parties for whose benefit the insurances are effected, the whole of the advantages, without subjecting them to the heavy drawback of accumulated premium notes.

Persons may effect insurance on their own lives and the lives of others.

A married woman can insure the life of her husband, the benefits of which are secured by law for the exclusive use of herself or children.

Clergymen and all others dependent upon salaries or their daily earnings are specially invited to avail themselves of a resource whereby their surviving families may be secured from the evils of penury.

Pamphlets explanatory of the principles of Mutual Life Insurance, and illustrating its advantages, with forms of application, may be obtained at the office of the company, 35 Wall street, or of any of its agents.

TRUSTEES.

Jos. B. Collins,	David C. Colden,
Wm. J. Hyslop.	Alfred Edwards,
R. H. McCurdy,	Wm. Betts,
Fred. S. Winston,	Joseph Blunt,
C. W. Faber,	Isaac G. Pearson,
John P. Yelverton,	Henry Wells,
Theo. Sedgwick,	Wm. Moore,
Stacy B. Collins,	Zebedee Cook,
John H. Swift,	Jona. Miller,
John Wadsworth,	David A. Comstock,
S. M. Cornell,	Robert Schuyler,
Gouv. M. Wilkins,	James Chambers,
John V. L. Pruyn,	Joseph Tuckerman,
Fred. Whittlesey,	Moses H. Grinnell,
Charles Ely,	Wm. J. Banker,
John C. Cruger,	Eugene Dutilh,
Walter Joy,	Francis S. Lathrop,
Alfred Pell,	John C. Thatcher.

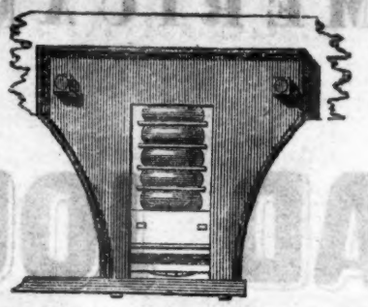
JOSEPH. B. COLLINS, President.
ISAAC ABBATT, Secretary. 3m9

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES, and Levels, with Fraunhoffers Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by

E. & G. W. BLUNT,
No. 179 Water St., cor. Burling Slip.
New York, May 19, 1849.

FULLER'S PATENT INDIA RUBBER SPRING.



THESE SPRINGS ARE THE CHEAPEST, the lightest and most durable of any yet known. They are easily applied to new or old cars, and there is small possibility of any accident occurring to them.

Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability.—Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed by Mr. Ray is fully established and has frequently been testified to. The following are from gentlemen who have had much experience with both Springs.

—

"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours." JOHN M'RAE,
Engineer S. Carolina R. R., Charleston.

—

"I do not hesitate to allow you to say that I concur in Mr. M'Rae's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M'Rae had seen your springs (as I believe) and entertain it still." WM. PARKER,
Gen'l Supt. of Baltimore and Ohio R. R.

—

Office of Sup't Norwich & Worcester R.R Co. }
December 26, 1849. }

"I most fully concur in the opinion of Jno. McRae, Engineer of S. Carolina Railroad, that 'Rays Springs are inferior to Fuller's Springs;' and shall with pleasure recommend them to all Railroad Companies for adoption. I have used both springs on this road and have no hesitation in saying that I should in all cases prefer Fuller's Spring."

SAM'L H. P. LEE, JR.,
Sup't and Engineer.

—

Office B. & P. R. R. Co., }
Boston, 20th December, 1849. }

"This company have cars fitted up with both Ray's and Fuller's 'Metallic India Rubber Springs,' and I do not hesitate to say that Fuller's arrangement is *very much superior* to Ray's.

W. RAYMOND LEE, Supt.

—

The following result has been obtain d by experiment upon one railroad.

A set of Trucks fitted with Steel Springs cost	$190·77	and weigh	2355 lbs.
The same with Fuller's Springs, . . .	131·71	"	1911 lbs.
Difference, . .	$59·06	"	444 lbs.

Not only is there an advantage in the cost, but owing to the great reduction in weight, the car can be made lighter throughout, and so an enormous saving in weight may be effected in a Train.

G. M. KNEVITT, 38 Broadway, N. Y.,
General Agent for the U. S.

The Springs can also be had of
JAMES LEE & CO., 18 India Wharf, Boston, &
JAS. THORNLEY, 110 Chestnut St., Philad.
January 2, 1850.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.
May 28, 1849.

NOTICE TO

Superintendents of Railroads.

TYLER'S PATENT SAFETY SWITCH.—The undersigned would respectfully call their attention to his Patent Safety Switch, which from long trial and late severe tests has proved itself perfectly reliable for the purpose for which it was intended. It is designed to prevent the train from running off when the switch is set to the wrong track by design or accident. The single rail or gate switch is established as the best and safest switch for the ordinary purpose of shifting cars from one track to another, but it is liable to the serious evil of having one track open or broken when connected with the other. My improvement entirely removes this evil, and while it accomplishes this important office, leaves the switch in its original simplicity and perfection of a plain unbroken rail, connecting one track with the other ready for use.

The following decision of the Commissioner of Patents is respectfully submitted to Railroad Engineers, Superintendents, and all others interested in the subject. P. B. TYLER.

(COPY.)

UNITED STATES PATENT OFFICE, }
Washington City, D.C., April 28th, 1846. }

SIR: You are hereby informed that in the case of the interference between your claims and those of Gustavus A. Nicolls, for improvements in safety switches—upon which a hearing was appointed to take place on the 3d Monday in March, 1846, the question of priority of invention has been decided in your favor. Inclosed is a copy of the decision. The testimony in the case is now open to the inspection of those concerned.

Yours respectfully, EDMUND BURKE,
Commissioner of Patents.

To Philos B. Tyler.

Any further information may be obtained by addressing P. B. TYLER, Springfield, Mass., or JOHN PENDLETON, Agent, 149 Hudson St., New York.

PHILADELPHIA CAR MANUFACTORY,

CORNER SCHUYLKILL 2D AND HAMILTON STS.,
SPRING GARDEN, PHILADELPHIA CO., PA.

Kimball & Gorton,

Having recently constructed the above works, are prepared to construct at short notice all kinds of

RAILROAD CARS, Viz:

Passenger Cars of all classes—Open and Covered Freight and Express Cars—Coal Cars—Hand Cars & Trucks of all descriptions.

They are also prepared to furnish Chilled Wheels of any pattern. Car Wheels & Axles fitted and furnished. Snow Ploughs and Tenders made to order. Steel and other Springs always on hand.

All orders will be filled at short notice, and upon as good terms as at any other establishment in the country.

Omnibuses from the Exchange run within one square of the manufactory every 10 minutes during the day.
Philadelphia, June 16, 1849. 1y25

C. W. Bentley & Co,

IRON Founders, Portable Steam Engine Builders and Boiler Makers, Corner Front and Plowman Sts., near Balttmore St. Bridge,

BALTIMORE, MARYLAND.

Their Engines are simple in their construction, compact and durable; they require no brick work in setting them, and occupyidg but a small space (a six horse power engine and boiler, standing on a cast iron plate of three by six feet.)

They also manufacture Major W. P. Williamson's new oscillating Engine; a superior article, combining cheapness and simplicity (one of which may be seen in operation at their shop.) Both of these engines are adapted to any purpose where power is required, and may be made of any capacity; and for economy in use of fuel are unsurpassed.

All kinds of machinery made to order. Steam Generators, Force Pumps, Wrought Iron Pipes and Fillings for Steam, Water, Gas, etc., constantly on hand,
Baltimore, June 6, 1849.

CORROSIVE SUBLIMATE.

THIS article now extensively used for the preservation of timber, is manufactured and for sale by POWERS & WEIGHTMAN, manufacturing Chemists, Philadelphia.
Jan. 20, 1849.

Coal.

CUMBERLAND SEMI-BITUMINOUS COAL superior quality for Locomotives, for sale by
H. B. TEBBETTS,
No. 40 Wall St., New York.
May 12, 1849. 1m19

IRON BRIDGES, BRIDGE & ROOF BOLTS, etc. STARKS & PRUYN, of Albany, New York, having at great expense established a manufactory with every facility of Machinery for Manufacturing Iron Bridges, Bridge and Roof Bolts, together with all kinds of the larger sizes of Screw Bolts, Iron Railings, Steam Boilers, and every description of Wrought Iron Work, are prepared to furnish to order, on the shortest notice, any of the above branches, of the very best of American Refined Iron, and at the lowest rates.

During the past year, S. & P. have furnished several Iron Bridges for the Erie Canal, Albany Basin, etc. —and a large amount of Railroad Bridge Bolts, all of which have given the most perfect satisfaction.

They are permitted to refer to the following gentlemen:

Charles Cook, Nelson J. Beach, Jacob Hinds,	Canal Commissioners of the State of New York.
Willard Smith, Esq.,	Engineer of the Bridges for the Albany Basin.
Messrs. Stone & Harris, Mr. Wm. Howe,	Railroad Bridge Builders, Springfield, Mass.
Mr. S. Whipple,	Engineer & Bridge Builder, Utica, N. Y.

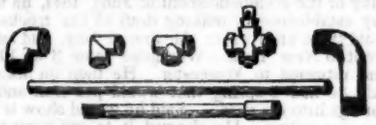
January 1, 1849.

TO RAILROAD COMPANIES AND BUILDERS OF MARINE AND LOCOMOTIVE ENGINES AND BOILERS.

PASCAL IRON WORKS.

WELDED WROUGHT IRON TUBES

From 4 inches to ¼ in calibre and 2 to 12 feet long, capable of sustaining pressure from 400 to 2500 lbs. per square inch, with Stop Cocks, T's, L's, and other fixtures to suit, fitting together, with screw joints, suitable for STEAM, WATER, GAS, and for LOCOMOTIVE and other STEAM BOILER FLUES.



Manufactured and for sale by

MORRIS, TASKER & MORRIS.

Warehouse S. E. Corner of Third & Walnut Streets,

PHILADELPHIA.

To Railroad Companies, etc.

The undersigned has at last succeeded in constructing and securing by letters patent, a Spring Pad-lock which is secure, and cannot be knocked open with a stick, like other spring locks, and therefore particularly useful for locking Cars, and Switches, etc.

Companies that are in want of a good Pad-lock, can have open samples sent them that they may examine and judge for themselves, by sending their address to C. LIEBRICH,

46 South 8th St., Philadelphia.

November 3, 1849. 6m*

Mattewan Machine Works.

THE Mattewan Company have added to their Machine Works an extensive LOCOMOTIVE ENGINE department, and are prepared to execute orders for *Locomotive Engines* of every size and pattern-also *Tenders*, *Wheels*, *Axles*, and other railroad machinery, to which they ask the attention of those who wish such articles, before they purchase elsewhere.

STATIONARY ENGINES, BOILERS, ETC., Of any required size or pattern, arranged for driving *Cotton*, *Woollen*, *or other Mills*, can be had on favorable terms, and at short notice.

COTTON AND WOOLLEN MACHINERY, Of every description, embodying all the modern improvements, second in quality to none in this or any other country, made to order.

MILL GEARING,

Of every description, may be had at short notice, as this company has probably the most extensive assortment of patterns in this line, in any section of the country, and are constantly adding to them.

TOOLS.

Turning Lathes, *Slabbing*, *Planing*, *Cutting* and *Drilling Machines*, of the most approved patterns, together with all other tools required in machine shops, may be had at the Mattewan Company's Shops, Fishkill Landing, or at 66 Beaver street, New York.

WM. B. LEONARD, *Agent.*

☞ HEAD QUARTERS FOR RUBBER GOODS. ☜

The Union India Rubber Company,

MANUFACTURERS AND DEALERS IN EVERY VARIETY OF

GOODYEAR'S PATENT METALLIC RUBBER FABRICS,

Which they offer on the most liberal terms at their Warehouse,

NO. 19 NASSAU STREET, NEW YORK.

Articles which this Company has the exclusive right to make comprise in part

Beds,	Overcoats,	Life Preservers,	Mail Bags,	Camp Blankets,
Pillows,	Leggins,	Boat Floats,	Breast Pumps,	Travelling Bags,
Cushions,	Syringes,	Souwesters,	Saddle Bags,	Wading Boots,
Caps,	Canteens,	Gun Cases,	Clothing of all kinds,	Horse Covers,
Tents,	Buoys,	Portable Boats,	Carriage Cloth, assor.	Piano Forte Covers,
Bottles,	Maps,	Horse Fenders,	Hospital Sheeting,	Railroad Gum,
Tubs,	Sheet Gum,	Water Tanks,	Mattrass Covers,	Hose, all kinds,
Caps,	Tarpaulins,	Army Goods,	Bathing Caps,	Shower Baths,
Pants,	Life Jackets,	Navy Goods,	Baptismal Pants,	Chest Expanders.

Together with *all new applications of the Patent Rubber*, which with Boots and Shoes, Packing, Machine Belting, Suspenders, Gloves and Mittins, Tobacco Wallets, Balls, Baby Jumpers, Elastic Bands, etc., etc., will be sold to the Trade at Factory prices.

*** All orders for special articles to be manufactured, should be accopanied with full descriptions and drawings.

October 20, 1849.

ETNA

SAFETY FUSE.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

☞ *Sole Manufacturers.* ☜

No. 85 Liberty St.

NEW YORK.

And in the principal cities and towns in the U. States.

☞ The Premium of the AMERICAN INSTITUTE was awarded to the *Etna Safety Fuse* at the late Fair held in this city.

November 3, 1849. 1y

RAILROAD
India-rubber Springs.

IF any Railroad Company or other party desires it, the NEW ENGLAND CAR COMPANY will furnish India-rubber Car Springs made in the form of washers, with metalic plates interposed between the layers, or in any other form in which they can be made; in all cases guaranteeing the right to use the same against any and all other pretended rights or claims whatsoever.

F. M. Ray, 98 Broadway, New York.
E. CRANE, 99 State Street, Boston.

1849.

DEAN, PACKARD & MILLS,

MANUFACTURERS OF ALL KINDS OF

RAILROAD CARS,

SUCH AS

PASSENGER, FREIGHT AND CRANK CARS,

— ALSO —

SNOW PLOUGHS AND ENGINE TENDERS OF VARIOUS KINDS.

CAR WHEELS and AXLES fitted and furnished at short notice; also, STEEL SPRINGS of various kinds; and

SHAFTING FOR FACTORIES.

☞ *The above may be had at order at our Car Factory,*

REUEL DEAN, ELIJAH PACKARD, ISAAC MILLS,	SPRINGFIELD, MASS.

1y18

Iron Safes.

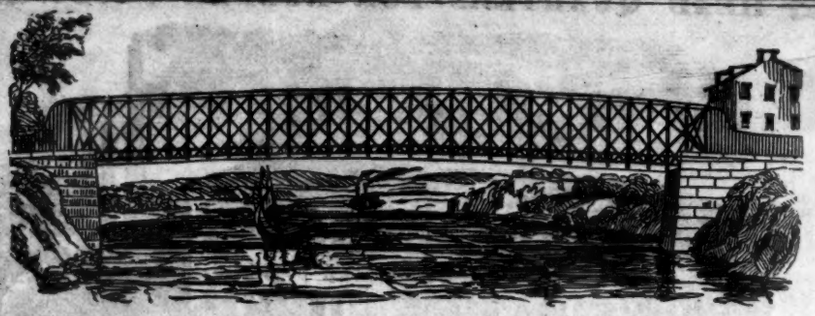
FIRE and Thief-proof Iron Safes, for Merchants, Banks and Jewelers use. The subscriber manufactures and has constantly on hand, a large assortment of Iron Safes, of the most approved construction, which he offers at much lower rates than any other manufacturer. These Safes are made of the strongest materials, in the best manner, and warranted entirely fire proof and free from dampness. Western merchants and the public generally are invited to call and examine them at the store of E. Corning & Co., sole agents, John Townsend, Esq., or at the manufactory.

Each safe furnished with a thief-detector lock, of the best construction.

Other makers' Safes repaired, and new Keys and Locks furnished at the shortest notice.

H. W. COVERT,
cor. Steuben and Water sts. Albany.

August 24, 1848.



NEW YORK IRON BRIDGE COMPANY.

The Bridges manufactured by this Company having been fully tested on different Railroads, by constant use for more than two years, and found to answer the full expectations of their most sanguine friends, are offered to the public with the utmost confidence as to their great utility over any other Bridge now known.

The plan of this Bridge is to use the iron so as to obtain its greatest longitudinal strength, and at the same time it is so arranged as to secure the combined principles of the *Arch, Suspension and Triangle*, all under such controlling power as causes each to act in the most perfect and secure manner, and at the same time impart its greatest strength to the whole work.

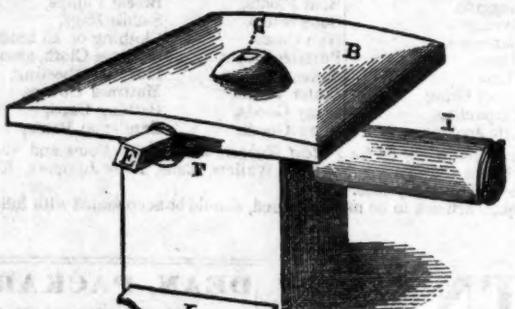
THE NEW YORK IRON BRIDGE COMPANY are prepared to furnish large quantities of Iron Bridging for Railroad or other purposes, at short notice, and at moderate prices.

Models, and pamphlets giving full descriptions of the above BRIDGE, with certificates based on actual trial from undoubted sources, will be found at the office of the Company, 39 Jauncey Court, Wall st., or of W. RIDER & BROTHERS, 19 *Nassau Street*, where terms of contract will be made known, and where orders are solicited.

M. M. WHITE,
Agent for the Company.

August 29, 1849.

E. Harris' Patent Rotary Blacksmith Tuyere.



LETTERS Patent were issued January 9, 1849, to E. HARRIS, of Springfield, for an Improved Rotary Blacksmith Tuyere. Since that time there have been some hundreds put in operation, giving satisfaction and full proof of superiority over all others.

This Tuyere is so arranged that by one movement it can be changed from the largest work to the smallest; at the same time the fire is changed in proportion, thereby making a great saving in coal. Words cannot convey the full merits of this Tuyere; nor is it deemed necessary to speak in disparagement of other Tuyeres, as every smith is capable of judging for himself, and will give merit where merit is due.

I will simply say that there has not been a single instance where I have had my Tuyere put in use but it has given full satisfaction, and is recommended by all who have used them, as being superior to any other ever introduced. I would invite all to give them a trial; and the names of those using them being given, I hope it may induce others to try them; they recommend themselves.

Western Railroad Shop,	Springfield,	Mass.
" "	Pittsfield,	"
Connecticut val. "	Springfield	"
" "	N. Hampton	"
Hartford "	Hartford,	Conn.
New Haven "	New Haven	"
Norwich and Worcester,	Norwich	"
N. York and N. Haven,	New Haven	"
Saratoga and Whitehall,	Saratoga,	N. Y.
Vermont Central,		
Hudson and Berkshire,	Hudson,	
L. Kingsley,	Canton,	Mass.
Hadley Falls Co.	Ireland,	
Sidney Patch,	W. Springfield,	Mass.
Ames Manuf. Cor.,	Boston,	"
American Machine w'ks,	Chickopee,	"
Dean, Packard & Mills	Springfield	"
G. Frank Bradley,	"	"
Andrew Baird,	N. Haven,	Conn.
Collis & Lawrence	"	"
Slate & Brown,	"	"
Gage,	Windsor Locks,	
Machine shop,	Nashua,	N. H.
Louis F. Lanney,	Manchester,	"
J. H. Baerdid,	Baltimore,	Md.
J. Fanning	179 Chambers st.	N. Y.
G. W. Hunt	Rochester,	"
Chamberlain & Waldo,	41 Gold st.	"
P. S. Burges, carriage maker,		"
Samuel Miller,		"
J. Leggett,		"
J. E. Harris,	Steverson falls,	"
John L. Graham,	Hillsdale,	"
David Dalsell,	Albany,	"
Roys & Wilcock,	South Egremont,	Mass.
	Berlin,	Conn.

Agents for the sale of Tuyeres:
B. B. Stevens in New York and Connecticut.
W. S. Seymour in Massachusetts and R. Island.
A. J. VanAllen has the Agency for the Western and Southern States, and is now travelling through those States. Any communication addressed to the patentee will receive prompt attention.

E. HARRIS, Patentee,
Springfield, Mass.

November 23, 1849.

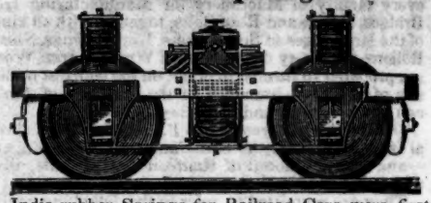
CHRONOMETERS.

MERCHANTS, Ship Owners, Captains and others, are invited to examine the advantages offered in the purchase of Chronometers, by HEWITT & SON, Makers, 99 Wall Street, (up stairs,) in their superior quality and great reduction of price.

H. & S. have for many years been engaged in the manufacture of Chronometers, for the first houses in the trad and also, for the Navy of most Nations, and have received numerous rewards for their superior performance. Their Chronometers may be obtained from the Observatory at Liverpool, by order from H. & S., and at City Road, London. They are warranted to give satisfaction; but if not approved of, will be exchanged in New York, London, or Liverpool.

Rating, Cleaning and Repairs, at *low charges*.
The Trade supplyed on the most liberal terms.
November 17, 1849.

F. M. Ray's Patent India-rubber Car Springs.



India-rubber Springs for Railroad Cars were first introduced into use, about two years since, by the inventor. The New England Car Company, now possesses the exclusive right to use, and apply them for this purpose in the United States. It is the only concern that has tested their value by actual experiment, and in all arguments in favor of them, drawn from experience of their use, are in those cases where they have been furnished by this company. It has furnished every spring in use upon the Boston and Worcester road, and, in fact, it has furnished all the springs ever used in this country, with one or two exceptions, where they have been furnished in violation of the rights of this company; and those using them have been legally proceeded against for their use, *as will invariably be done in every case of such violation.*

The Spring formed by alternate layers of India-rubber discs and metal plates, which Mr. Fuller claims to be his invention, was invented by Mr. Ray in 1844.—In proof of which we give the deposition of Osgood Bradley, of the firm of Bradley & Rice, of Worcester, Mass., car manufacturers, and men of the highest respectability. In this deposition, in relation to the right of parties to use these springs, he says:

"I have known Mr. Ray since 1835. In the last of May or the commencement of June, 1844, he was at my establishment, making draft of car trucks. He staid there until about the first of July, and left and went to New York. Was gone some 8 or 10 days, and returned to Worcester. He then on his retnrn said he had a spring that would put iron and steel springs into the shade. Said he would show it to me in a day or two. He showed it to me some two or three days afterwards. It was a block of wood with a hole in it. In the hole he had three pieces of India-rubber, with iron washers between them, such as are used under the nuts of cars. Those were put on to a spindle running through them, which worked in the hole. The model now exhibited is similar to the one shown him by Ray. After the model had been put into a vice, witness said that he might as well make a spring of putty. Ray then said that he meant to use a different kind of rubber, and referred to the use of *Goodyear's Metallic Rubber*, and that a good spring would grow out of it." There are many other depositions to the same effect.

The history of the invention of these springs, together with these depositions, proving the priority of the invention of Mr. Ray, will be furnished to all interested at their office in New York.

This company is not confined to any particular form in the manufacture of their springs. They have applied them in various ways, and they warrant all they sell.

The above cut represents precisely the manner in which the springs were applied to the cars on the Boston and Worcester road, of which Mr. Hale, President of this road speaks, and to which Mr. Knevitt refers in his advertisement. Mr. Hale immediately corrected his mistake in the article quoted by Mr. Knevitt, as will be seen by the following from his paper of June 8, 1848. He says:

INDIA-RUBBER SPRINGS FOR RAILROAD CARS.—"In our paper yesterday, we called attention to what promises to be a very useful invention, consisting of the application of a manufacture of India-rubber to the construction of springs for railroad cars. Our object was to aid in making known to the public, what appeared to us the valuable properties of the invention, as they had been exhibited on trial, on one of the passenger cars of the Boston and Worcester railroad. As to the origin of the invention we had no particular knowledge, but we had been informed that it was the same which had been introduced in England, and which had been subsequently patented in this country; and, we were led to suppose that the manufacturers who have so successfully applied this material, in the case to which we referred had become possessed of the right to use that patent. It will be seen from the following communication, addressed to us by a member of the company, by which the Worcester railroad was supplied with the article upon which our remarks were based, that we were in an error, and that the springs here introduced are an American invention, as well as an American manufacture. How far the English invention may differ from it we have had no opportunity of judging."

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

PUBLISHED WEEKLY, AT No. 136 NASSAU ST., NEW YORK, AT FIVE DOLLARS PER ANNUM IN ADVANCE.

SECOND QUARTO SERIES, VOL. VI., No. 14.] SATURDAY, APRIL 6, 1850. [WHOLE No. 729, VOL. XXIII.

ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*

GEN. CHAS. T. JAMES, *For Manufactures and the Mechanic Arts.*

M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, April 6, 1850.

Northwestern Lead Mines.

Continued from page 194.

The following are the estimates of the expense of working one of these furnaces. Being made at different furnaces they will be seen to differsomewhat.

Expenses of Blast Furnaces Two Shifts.

Two smelters, $1 54 per day	$3 08
Two back hands, 78 cents	1 56
Two assistants, 69 cents	1 38
Fuel, 20 bushels charcoal, 12½; wood, 50	3 00
Board six hands, 35 cts	2 10
Ore 6,000 lbs. at $15	90 00
Hauling ore	3 00
Hauling 4,200 lbs. lead to Galena	12 60
Daily expense	$116 72

Transportation to Galena need not be more than 20 cents per hundred pounds, making a difference in this item of $4 20. The charcoal may be made for less on one's own land, and one-fifth of the price of the ore might be saved if the whole were mined on land belonging to the furnace—four-fifths, if the discovery too was the proprietor's.

Product, 4200 lbs., worth $126. Slag worth —.

Expenses of Blast Furnaces, One Shift.

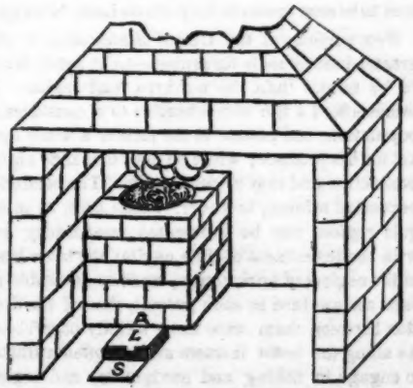
Ore smelter	$1 15
Two assistants, 57½ cents	1 15
Fuel, 8 bushels charcoal, 12½; wood 50	1 50
Board three hands, 50 cents	1 50
Ore, 3,000 lbs. $15	45 00
Hauling ore nine miles to furnace, 75 cents.	2 25
Hauling lead to Galena, 2,100 lbs	4 20
Daily expense	$56 75

One-fifth ore rent saves $9. Hauling the ore and board may be much less. The wages as estimated are lower than workmen could generally be employed for.

Product 2100 lbs., worth $63. Slag worth —.

The amount of lead obtained from the ore is usually estimated at seventy per cent. Ten to twelve per cent. then is lost, and remains in the slag.—The walls and front of the furnace are always covered with a thick incrustation of oxide and sulphur of lead, and much more goes off in the white smoke, all of which might be saved were it an object.

In estimating the importance of this business, it must be taken into account, that it is not always an easy matter to keep *one* furnace supplied with ore, much more several. And again, that the returns for the sale of the lead are at the price it brings at Galena with the merchants there, who make their profits by shipping it to the eastern market.



The slag furnace, represented in the accompanying figure, is often connected with a blast furnace or a reverberatory, particularly when the smelter can obtain any of the old slag from the now abandoned ash furnaces to mix with what he makes.—At some furnaces the slag is beaten under stamps and washed through a series of pits, but generally it is merely broken by hammer into small lumps and then thrown into the furnace. The size of this is about four feet in height, four feet in depth and five feet across the front. The twere is introduced from behind, opposite the hole for the exit of the lead and slag. In the figure, L is a vessel to catch the lead. The slag flows over into the hole S, thro' which runs a current of water. The fuel used is charcoal.

The principle of the slag furnace differs from that of the blast furnace, in which the ore is exposed to the greatest oxidizing action to be obtained—the object being thoroughly to melt the slag and keep it in a fluid state, until the metal separates, and both run out together through the hole in front. The blast furnishes a supply of oxygen for the complete reduction of the ore that had before escaped its action, and maintains the intensity of the fire. The lead sinks into the first vessel, the slag floats over it into the next, through which runs a stream of water. Here it is cooled, and then ladled out and thown away. It is generally believed that this glassy slag is nearly free of metal. To determine this, I digested some of it in nitric acid, separated the silica, and threw down the lead as a sulphuret by hidro-sulphuric acid; after converting this into sulphate of lead and weighing I found it still contained 24·72 per cent. of oxide of lead, equal to 22·9 per cent. of lead.

The amount of lead produced by one of these furnaces varies of course with the quality of the slag. At O'Neill's slag furnace on the Peccatolica, near Mineral Point, where the charge consists of the rich reverberatory furnace slag, and that from the old ash furnaces, twenty-seven pigs of lead are frequently obtained at one shift or day's work, twenty-five are always considered a fair amount for one day. The hands employed are a smelter, back hand and assistant.

According to Dr. Owen the number of furnaces in the lead region in 1839 was fifty. Four of them were in Iowa, and about as many in Illinois.—About sixteen of the whole were reverberatory furnaces, the rest principally blast. These fifty furnaces were estimated to make 30,000,000 pounds of lead annually, which is 600,000 pounds of each on the average. But six of them are estimated to make 1,000,000 pounds each, four from 1,260,000 to 1,502,200 pounds each, while seven make only from 400,000 to 194,610 pounds each, the smallest quan-

tity made by any one furnace. The number of miners working at intervals, say half of each year, is estimated on the same authority at three thousand. By dividing the amount produced among those employed according to the established proportions, the business as a whole appears to be a paying business, but not a lucrative one. There are chances however in this, as in all other operations, by which miners and smelters have done much better than the average. There is a great want of capital in the country, by means of which the business might be conducted more independently of immediate returns, and ore or even lead be bought when the prices are the lowest. The possession of timber lands would be no small saving in a district where wood is worth $5 per cord, as it is in the winter at Mineral Point, and where charcoal sells at the extravagant price of twelve and a half cents a bushel.

From the St. Louis Price Current and Commercial Record, published on the 5th January of the present year, we gather the following data as to the extent and progress of the business since the year 1840:

"*Table of the Entire Product of the Upper Mines.*

Year.	Pigs.	Year.	Pigs.
1841....	463,104	1846....	732,403
1842....	473,699	1847....	772,656
1843....	584,113	1848....	681,969
1844....	624,601	1849....	625,562
1845....	778,469		

It will be perceived that there has been considerable falling off in the production for the past two years; the total of this year being about equal to that of 1844.

We have no data by which to judge of the product of the lower mines; but from the best information we can get, the falling off has been equal to that of the upper mines. It is evident that the consumption of the article is rapidly on the increase. The following is the amount used by our city manufacturers:

	Pigs.
Kennett, Simonds & Co., shot manufacturers.	70,000
Henry T. Blow, white lead "	20,000
T. H. Warren & Co., " "	9,000
J. W. Roberts, sheet and lead pipe "	20,000
	119,000"

The production of the lower mines (those of Missouri) is not given in this estimate. This may be from ten to fifteen per cent. of that of the upper mines. The diminution in the yield of the mines since the year 1847 we think is to be ascribed to causes entirely independent of their real productiveness. They are worked by a class of people of roaming habits, whom the rumor of a new discovery leads to abandon their temporary "diggings" for a chance elsewhere. They invest little capital in permanent operations, and are as free to go at any time to Lake Superior or California, as to the discoveries in an adjoining county. It is these new mineral regions that have drawn off large numbers of the lead miners—some of the most enterprising we know among them, and we look to a still greater falling off in the production of lead for this reason for years to come.

The deficiency in the supply of what is required for the country is so great, that, as we find by the Price Current above quoted, 300,000 pigs of foreign lead have been imported the past year. This importation is still largely going on, and is not likely soon to cease any more than that of iron; for tho' our mines of both these metals are as rich and extensive as any in the world, our vast country continues to open too many new resources to admit of their being wrought to the extent necessary to supply our demand, in competition with the low prices of labor in foreign countries.

The transportation of lead from the furnaces of Wisconsin is usually conducted by teamsters from Illinois. They take loads from Mineral Point to Galena—forty miles—at twenty cents per hundred pounds, using oxen, which for six months in the year pick up their own feed in the road, when the drivers stop during the day, or at night to camp.

The most eastern mines—those on Sugar creek, are within one hundred miles of Racine, the nearest port on Lake Michigan. The produce of these must eventually find an outlet in this direction instead of going down the Mississippi river. At the usual rate of expenses of hauling lead by teams, two tons may be carried 100 miles for $21 75, and what back loads could be procured would go to diminish this amount. But the railroad now rapidly progressing from Chicago towards Galena will soon change the course of transportation of the greater part of the lead from the upper mines, and it will be delivered in our northern cities by the lakes, instead of making the circuit of nearly the whole of the United States. At present the cost of transportation from Galena to St. Louis is from 15 to 30 cents per hundred pounds; the price varying with the stage of the water. From Galena direct to New York, the usual estimate for the transportation of 100 pounds is $1 25; but this may be considerably reduced and much time saved by the owner going on himself with a large amount of lead.

From ports on Lake Michigan lead could be shipped to New York for something less than $12 per ton—probably for fifty cents per 100 pounds. Allowing five dollars per ton transportation and charges to Chicago, there would be a large balance in favor of the lake route with due allowance for extra charges.

It must certainly hereafter be regarded as an extraordinary fact, that for so many years lead should have been transported such immense distances for the supply of localities so near its place of production. The great extent of populous country bordering the lakes, even the eastern part of Wisconsin itself, has received this article and the shot and white lead manufactured from it, after it was carried down the Mississippi river to New Orleans, and thence shipped to New York or Boston, and again transported back towards its original locality. It is yet we believe rather unusual for a load of lead to be sent across to the ports on Lake Michigan.

Few portions of the United States seem to offer greater inducements for settlers—to be better favored by nature than the northern lead region. Its mines afford a fair compensation to a considerable population, and insure to the farmer a home market for his produce; while he finds the lands highly productive and easy of cultivation. The seductive pursuit of mining, however, which here, as in the gold region, can be prosecuted temporarily and with the investment of little capital, too often leads to the neglect of agriculture; and less favorable results are attained in each pursuit, than if the division between them were more strictly observed.—As along the coast farmers are too often attracted to engage in fishing and navigation, and neglect their farms, so at the western mines, they are perhaps too much inclined to dig deeper into their lands than the point where they would find their greatest richness. In salubrity of climate no region exceeds that of the more elevated portions of the lead district. Fevers and agues contracted along the banks of the larger streams, are soon cured in the pure air around Mineral Point. The winters, it is true, are rather severe, and the north winds blow cold over the open prairies. Still the climate is healthy, and conducive to industry. H.

[*Foreign Correspondence of the Railroad Journal.*]

H. V. Poor—Dear Sir—After sundry journeyings by land and sea, I find myself transported from the capital of France to Naples. This city I have been accustomed from my early years to regard as most nearly realizing my ideas of perfection, for all that is beautiful in scenery or delightful in climate. Its claims to the former have not been so much overrated. The well cultivated environs clad with the vine and the olive tree, bespotted with cottages, and bounded by picturesque mountains; its bay, opening into the broad sea, and crowned with islands, are beautiful indeed! But its climate disappointed me. The more distant mountains, and even Vesuvius, are covered with snow. The fountains are mounted with ice. Chill, damp winds blow in from the sea, often accompanied by rain and hail. Houses have only the most primative conveniences for fire, with which it is impossible to expel the cold and humidity; to this add the half frozen aspect of the almost naked beggars that throng the streets, and crying with cold and hunger, huddle together like cattle in every sheltered and sunny place; and you have a picture of winter in Naples, somewhat different from that you have been used to associate with it I fancy, yet nevertheless, a true one. All this a person in good health can of course endure without serious inconvenience; but the invalid who leaves the comforts of a home in New York or in New England to pass the winter here, must be disappointed in the advantages for health, unless indeed he arrive in season to surround himself with those conveniences and comforts which Americans, better than any other people, know how to provide and appreciate.

Naples has been, in times past, distinguished by the appellation "noble" on account of the great number of nobility and gentry who resided here; but there is not much in her present condition to merit that title.

Neither her public nor private buildings are distinguished for architectural beauty or imposing appearance. The streets are for the most part narrow, dark and without sidewalks. The nobility though numerous, can boast little more than the name. They have an honest saying here, that the nobility sport a fine carriage with servants in livery abroad, and live on maccaroni at home. In point of population it ranks next to Paris and London among European cities h,aving 400,000 inhabitants; but of these about 40,000 are beggars and lazzeroni, as many more are ecclesiastics, all of whom, together with the nobility, are a burden upon the producing classes, and of course render their condition anything but prosperous. This last fact, which applies as well to the whole kingdom as to Naples, is of itself a sufficient explanation of the recent political disturbances which had well nigh unseated the present king, Ferdinand II. from his throne. The movement commenced at Palermo, in Sicily, a short time before the Revolution of February, 1848, at Paris, and was at first quite successful. Messina next followed the example, and a general spirit of revolt throughout the kingdom soon manifested itself—some good fighting was done particularly at Messina, but for want of competent leaders, the people would have been entirely successful. It is all over now however. The king

and priests have triumphed, to exercise a more despotic sway than ever; but they are in the midst of volcanic elements, which like Vesuvius, even now manifest evidence of agitation, and are liable at any moment to be thrown into a state of commotion. That they are aware of this, is evident, from the fact that they have thrown some 6,000 persons into prison, (may say 10,000) since the people laid down their arms, and a quarantine has been established at every port in the kingdom to prevent the return of the thousands who were obliged to fly their country to escape imprisonment or death.—The quarantine it is true was ordered under pretence of the cholera at Marseilles; but it was so well understood to be political rather than sanatory and was so vexatious withal, that strong intimations from the English and French governments caused its removal the first of the present month, much to the gratification of travellers who wished to visit the country, and of the people who are suffering excessively from the embarrassments of trade caused by the disturbances, and continued by this annoying embargo upon commerce.

The kingdom of the two Sicilies embraces the islands of that name, and enough of the boot of Italy to make altogether 31,616 Italian miles, or about 41,000 English miles, and is divided into 22 provinces, each of which is under the jurisdiction of a governor called Intendent, and these are again sub-divided into 76 districts, for each of which is a sub-intendent. These officers are the tools of the king, whose power before the late outbreak had scarcely any effectual check, and now may be said to have none save that occasioned by fears of the wail of an over oppressed people.

Three-tenths of the land is estimated to be occupied by towns, roads, water and mountains. Six-tenths are in tillage and orchards, and one-tenth in wood. Situated between 36° and 38½° N. latitude, this kingdom has an excellent climate for agricultural productions, and a soil almost unsurpassed for fertility, yet the oppressed condition of the people, and the narrow, monopolising policy of the government has so destroyed all energy and enterprise that it is miserably poor compared with what it might be. Grain could be raised in almost any quantity, yet hardly enough is raised for home consumption. Its waters abound in fish, yet large quantities are annually imported from Newfoundland. Wool is easily produced, yet little is exported. There are extensive iron mines in the Calabrian forest, but being worked by government monopoly, an annual product of only 22,900 cwts. is afforded. Nearly all the wrought iron used in the kingdom comes from abroad. Olive oil is the most valuable article of foreign trade produced in the kingdom, amounting to 36,000 tons of $3,729,-000 in value. Small quantities of manufactured silks are sent from Palermo, Calabria and Santa Leuse. Naples manufactures large quantities of gloves of an inferior quality. Sicily exports wine, sulphur, sumac, fruits and spirits. The sulphur mines are, I am told, entirely under the control of English manufacturers, to whom they are indispensible. An English merchant informed me that but for the supply of sulphur from these mines, the dyeing, printing and tanning establishments of Manchester could not be operated a single month, and that an adequate supply can be obtained from no other source. He spoke in no measured terms of indignation against his government because they did not improve the opportunity of the rebellion, to get possession of the islands and make sure of the mines; the possession of which by any other powerful nation would enable it at once to ruin their manufactures. If these islands are really so important a key as represented, we may expect England will yet have some warm contests with her enemies about them.

The ports of Naples, Catanea, Messina and Palermo in this kingdom are quite well situated for commerce, yet so far as I have been able to get statistics the same want of thrift and enterprize is indicated in this branch of business as in agriculture and manufactures. The statistics are very incomplete and unsatisfactory. Serristori estimates the exports of the mainland provinces in 1771 at $6,-216,000, and the imports at $6,606,720, and in 1837 the exports of the same provinces are set down at only $7,740,962, and the imports at $10,501,256, being a very slight increase in a period of 66 years. The returns for the ports of Sicily are equally irregular and unreliable, yet from 1838 to 1839 I notice a very large increase of trade with the United States, and I regret that I have found no later returns upon this point. The exports from Sicily in 1838 were in value $4,716,119, of which the United States received $623,717. The imports for the same year amounted to $2,691,434, of which $71,-910 were furnished by the United States. In 1839, the exports amounted to to $5,996,188, of which the United States received $1,748,120. The imports are stated at $2,526,251, of which the United States furnished $319,227. The value of imports furnished the latter year by the United States being more than quadruple those furnished in the former, while the total amount of imports the latter year are put down as actually less than in the year previous. There is a corresponding falling off in the amount of imports furnished by England for this year, which would seem to indicate that the United States had been a successful competitor with her for the Sicilian trade. I would like exceedingly to see the result in subsequent years, but am not able to find sufficient data.

The Neapolitan and Sicilian registers of 1830 give 6943as the whole number of vessels in the kingdom. Of these 1,485 were small fishing boats, and a larger portion of the remainder very small trading coasters. In 1833 they show in all 7,600 vessels, but as there is no registry of tonnage upon the main land I take the average of those of Sicily, (18 tons each) which makes the total tonnage of the kingdom 136,800, about one-third that of the city of Liverpool.

These data are not so recent as I would like, yet there having been no advance in any thing since 1830, when the present king, this impersonation of dullness and obstinacy, came to the throne, they will give a tolerably accurate idea of the present amount of tonnage and commerce.

The whole extent of railroads in this kingdom is less than 50 miles. That from Naples to Nocera, passing over Herculaneum and near Pompeii is about 18 English miles in length—was built by a French company and completed in 1840. The rails are from England and the machinery from France. The road is quite good. Trains move from 12 to 15 miles the hour. There are four classes of carriages. In the third class servants, and indeed any body may ride who clothes his head and feet. The fourth class is for the hatless and shoeless passengers, having no seats, and much resembling our cattle cars. This class of passengers was quite as numerous as any. This road has a branch that deviates to the right after passing Portici, passes through two or three villages and then joins the main track. The other road extends from Naples to Caserta and Capua, is of about the same length, being 20 miles, and of the same character as the other. One acquainted with railroads will see nothing in either worthy of imitation.

Such a thing as a telegraph is not to be found here, and would be of very little use if constructed; for the chief point in the policy of this astute court is to prevent as much as possible all communication among the people, and to lay every restriction upon the dissemination of intelligence.

The population of the kingdom is 7,600,000 or there about, of which about 125,000 are ecclesiastics.

Railroads between the Hudson River and Buffalo.

The following resolutions were passed at a meeting of delegates from all the railroad companies between the Hudson river and Lake Erie on the central line of railway held at Albany, 6th March, 1850:

Resolved, That this line of railroad, being limited in the amount of freight which may be transported, by the *state tolls* which are required to be paid, cannot reduce the fare of passengers to the same rates that other lines are able to fix, where tolls are not required.

Resolved, That there should be a difference in the fare between the express trains and those which are run at a lower rate of speed.

Resolved, That in order to meet the expectations of the public as far as practicable, having proper reference to the principles set forth in the foregoing resolutions, that the first class *through* fare on all other than the express trains, be fixed as near as may be at *two and a half* cents per mile for the whole distance between Buffalo and Albany.

Resolved, That the following trains be run during the ensuing season:

1st. Train leaving Albany at 7½ a.m. and Buffalo at 6½ a.m. running through in 12 hours, time to be distributed according to distance.

2d. Train leaving Albany and Buffalo at 9 a.m. and running through in 17 hours, time to be distributed according to distance.

3d. Train leaving Albany and Buffalo at 2 p.m. and running through in 24 hours, time to be distributed according to distance.

4th. Train leaving Albany and Buffalo at 7 p.m. and running through in 14 hours, time to be distributed according to distance.

RATES OF FARE.

On the 1st & 4th train express, $9 75 Albany to Buffalo.
On the 2d trains, mail and accommodation $8 00 do. do.
On the 3d trains, emigrant and 2d class, $5 00 do. do.

Whereas it is indispensably necessary in order to make the day express trains perform uniformly, their trips in the time allowed—12 hours—and in order to preserve uniformity and perfect concert of action, without which it will be impossible to depend on each other for promptness on this line.

Resolved, That the day express train shall stop on the several roads, at the following and no other places, for wooding, watering, and change of cars, namely: Schenectady, Fonda, Little Falls, Utica, Oneida, Syracuse, Auburn, Geneva, Canandaigua, Rochester, Batavia, and Attica.

Resolved, That in the event of the tolls being taken off from freight, transported on this line of railroad, between Buffalo and Albany, the charge for transportation will be reduced at least equal to the amount of the tolls, and the fare for first class passengers, on all except the express trains, in the judgment of this convention may be reduced to two cents per mile.

Resolved, That no other persons than those employed by the railroad companies, at the several stations, shall be allowed to take any charge of baggage or of the checks, except by the direction of the owner of such baggage.

Resolved, That a committee be appointed to mature a plan in regard to free passengers, and communicate the same to each company here represen-

ted, and solicit their action thereon, and an interchange of their conclusions in regard to the plan presented; and that the same committee prepare a circular on the subject of free passengers, and communicate the same to the various railroad companies in the Union. Messrs Wilkinson, Corning, Whitlesey and How, were appointed this committee.

THOMAS Y. HOW, Jr.
Secretary.

On the Construction of Roads.

Continued from page 194.

Friction.—The resistance of friction arises from the rubbing of the wheels against the surfaces with which they come in contact, and will always exist, however the surface may be improved. Its two extremes may be seen on a road of loose gravel, and on a railroad. It is greatly increased when the surface is covered with mud, or other loose material, into which the wheel may sink, and thus give a wider contact. The degree in which it is influenced by the surface, may be shown by rolling an ivory ball successively over a carpet, a fine cloth, a smooth floor, and a sheet of ice; the distances to which the same force will impel it over these surfaces increasing in the order in which they have been named.

The surface may be improved by the various methods of diminishing the friction, to be examined in chap. IV., such as "Macadamizing" the road or covering it with a layer of finely broken stones; paving with smooth stone blocks; covering with planks; or laying wheeltracks of stone, wood or iron.

The friction on all these surfaces is different, and can be determined only by experiment. The instrument used for measuring it is called a *Dynamometer*. It resembles in principle and general construction the "spring balances" in common use, in which the application of weight compresses a spiral spring, the shortening of which, as shown by a properly graduated scale, indicates the amount of weight applied. In the dynamometer the power takes the place of the weight of the spring-balances, one end of the instrument being connected with the carriage, and the other with the horses, and the force which they exert to overcome the friction being shown by the index.

Sir John Macneil has greatly improved the instrument, by adapting to it a piston working in a cylinder full of oil, which lessens the vibrations of the index, and enables its indications to be read with more ease and precision. He has also added to it a contrivance for making the instrument itself record the degree of force exerted at each moment of motion. It likewise registers the distance passed over, and the rises and falls of the road.*

This valuable instrument affords a means of ascertaining the exact power required to draw a carriage over any line of road; it will thus enable one line of road to be compared with another, and their precise amount of difference in case of draught, to be determined; it will show the comparative value of the different methods of improving the surface; and it will enable a registry to be kept from year to year of the state of a road, showing where and how much it has improved or deteriorated, and therefore how judiciously, or the contrary, the funds expended on it have been applied.

The following are the results of experiments made with this instrument on various kinds of road.—The wagon employed weighed 21 cwt., and the resistance to draught was as follows:—

* On a gravel road, laid on earth—per 21 cwt	147 lbs.	=1-16
* On a broken-stone road, laid on earth per 21 cwt	65	=1-36
* On a broken-stone road, on a paved foundation, per 21 cwt.,	46	=1 51
* On a well made pavement, per 21 cwt	33	=1-71
† On the best stone track-ways, per gross ton	12¼	=1·179
‡ On the best form of railroad per gross ton	8	=1·286

* For a full description of this instrument, see *Parnell*, pp. 327-347.

* Parnell, pp. 43, 73.
† Ibid. p. 107.
‡ Lecount, p. 219.

From the above experiments we infer, in round numbers, taking the maximum load on a gravel road for the standard, that a horse can draw—

On the best broken-stone road 3 times as much.
On a well made pavement.... 4½ times as much.
On the best stone track-ways..11 times as much.
On the best railways.....18 times as much.

Poncelet§ gives the following relations of the friction to the pressure, for wheels with iron tires rolling on different surfaces:

On a road of sand and gravel.....1-16
On a broken-stone road, in ordinary condition.1-25
" " in perfect condition..1-67
On a pavement in good order, at a walk.....1-54
" " at a trot.....1-42
On oak planks not dressed.....1-98

The most complete series of experiments upon the friction of vehicles have been recently made by M. Morin.‖ Some of the most important results are given below, in a tabular form. The fractions express the relation of the force of draught to the total load, vehicles included.

	Character of the vehicle.					
	Carts.	Trucks of 2½ tons.	Diligences of 5 tons.	Carriages with seats hung on springs.		
New road, covered with gravel, five inches thick	1-12	1-9	1-8	1-8		
Solid causeway of earth, covered with gravel 1½ inch thick	1-16	1-11	1-10	1-10		
Causeway of earth in very good condition	1-41	1-29	1-26	1-26		
Oaken platform	1-70	1-46	1-41	1-42		
Broken-stone road.		Wlk.	Trot.	W.	T.	
Very dry & smooth.	1-75	1-54	1-48	1-41	1-49	1-42
Moist or dusty	1-53	1-38	1-34	1-27	1-34	1-27
With ruts and mud.	1-33	1-24	1-21	1-18	1-22	1-19
Deep ruts and thick mud	1-19	1-14	1-12	1-10	1-12	1-10
Pavement, dry	1-90	1-65	1-57	1-38	1-59	1-39
" muddy.	1-69	1-50	1-44	1-33	1-45	1-34

From the above table it is apparent how important is the condition in which the best made road is kept, and how greatly the labor of draught is increased by mud or dust on its surface. The character of the vehicle is also seen to have great influence on the degree of friction.

It is also found that on compressible roads, such as earth, sand, gravel, &c., the resistance is independent of the velocity. On roads of broken stones and on pavements, the resistance increases with the velocity; but the increase is less in proportion as the road is smoother and the vehicle is better suspended.

On roads of broken stones and on pavements, the resistance is sensibly proportional to the pressure, and inversely proportional to the radius of the wheels. It is independent of the number of the wheels, and nearly so of the breadth of the tire.—On compressible roads the resistance decreases when the breadth of the tire increases.

PLANK ROADS.

Plan and Cross Section of a Plank Road.

The most valuable improvement since McAdam's, and one superior to his in many localities, is the recent invention of covering roads with planks. Plank roads were introduced in Canada by the governor general, Lord Sydenham, who had seen their utility in Russia. In 1834, the first one was there constructed, (leading from Toronto eastward,) and since then five hundred miles of them have been there built. In the United States, the one from Syracuse to Central Square, N. Y., led the way, being finished in July, 1846; and its great success has already caused the construction of four or five hundred miles in this state, and the projection of twice as many more in it, and in New Jersey, Ohio, Michigan, Wisconsin, etc.

In the most generally approved system, two parallel rows of small sticks of timber (called indifferently *sleepers, stringers or sills*) are imbedded in the road, three or four feet apart. Planks, eight feet long and three or four inches thick, are laid upon these sticks, across them, at right angles to their direction. A side track of earth to turn out upon, is carefully graded. Deep ditches are dug on each side, to ensure perfect drainage; and thus is formed a plank road.

The benefits of covering the earth with some better material has been indicated on page 188, and the peculiar advantages of this plank covering will be more fully made known, when we shall have drscussed in order the various details of construction.*

LAYING THEM OUT.

The waste of labor caused by unnecessary ascents in a road, has already been pointed out. It was also shown that it is profitable to the traveller to go two or three thousand feet around to avoid ascending a hill a hundred feet high; though the cost of constructing the additional length of road *partially* counterbalances this consideration. It was also proved that the smoother the surface of the road was made, the more injurious proportionally were such ascents. They are therefore especially objectionable on plank roads which hold an intermediate place between common roads and railroads. Some distinguished engineers have been led astray on this point. Their arguments, if carried to their full extent, would lead to the construction of railroads also with similar steep grades. It is true, as they state, that a given load can be drawn up a much steeper hill on a plank road than on a common one, the friction on the former being so much less, but (as proven on pages 34 and 35, which see) this will lessen in an equally increased ratio the advantages of the level portions of the road. Let us assume the resistance of friction, or "sticktion," (as Professor Whewell calls it,) on a plank road to be one-third of that on a good earth road. It will therefore be one-sixtieth of the weight carried, if that of the earth be one-twentieth. If, now, a horse can draw one ton on the level earth road, the total resistance will be doubled when he comes to a hill which rises one foot in going twenty, (1 in 20,) and he will be able to draw only half a ton up this hill, and therefore his load on the level parts of the road would be but half a ton; for it would be useless for him to take more *to* the hill than he could drag *up* it. Now suppose the same road to be planked, and this hill to remain untouched. On the level portions the same horse can now draw *three* tons, by our hypothesis. But the hill, rising 1 in 20, will offer a resistance three times as great as does the "stiction" of the plank road, and the whole resistance in going up it will therefore be *four times* as great as on a level. The horse can therefore draw only one-fourth of his former load, or only three-quarters of a ton, which is consequently the limit of his load on the level. Thus then this hill has brought down the *gain* of the plank road over the earth to only a quarter of a ton, instead of two tons, which it would be were the hill removed. Therefore, in laying out a plank road, it is indispensable, in order to secure all the benefits which can be derived from it, to avoid or cut down all steep ascents.

A very *short* rise, of even considerable steepness, may, however, be allowed to remain, to save expense; since a horse can, for a short time, put forth extra exertion to overcome such an increased resistance; and the danger of slipping is avoided by descending upon the earthen track.

A plank road, lately laid out, under the supervision af Mr. Geddes, between Cazenovia and Chittenango, N. Y., is an excellent exemplification of the true principles of roadmaking. Both these villages are situated on the "Chittenango creek," the former being 800 ft. higher than the latter. The most level common road between these villages rises more than 1,200 feet in going from Chittenango to Cazenovia, and rises more than 400 feet in

§ Mecanique Industrielle, p. 507.
‖ Aide-Memoire de Mecanique, p. 337.

* Hon. Philo White's report to the Council of Wisconsin, February, 1848, embodies a very extended and systematic collection of information on this subject. To it, and to the valuable published and obliging private communications of Hon. Geo. Geddes, C.E., (who first introduced and naturalized this improvement in the United States) the author is much indebted, as also to many other recent sources.

going from Gazenovia to Chittenango, in spite of this latter place being 800 feet lower. It thus adds one half to the ascent and labor, going in one direction, and in the other direction it goes up hill one-half the height, which should have been a continuous descent. The line of the *plank road*, however, by following the creek (crossing it five times,) ascends only the necessary 800 feet in one direction, and has no ascents in the other, with two or three trifling exceptions of a few feet in all admitted in order to save expense. There is a nearly perpendicular fall in the creek of 140 feet. To overcome this, it was necessary to commence, far below the falls, to climb up the steep hill-side, following up the sides of the lateral ravines, until they were narrow enough to bridge, and then turning and following back the opposite sides till the main valley was again reached. The *extreme* rise is at the rate of one foot to the rod, (1 in 16½;) and this only for short distances, and in only three instances, with a much less grade, or a level, intervening. The line passes through a dense forest, which supplied its material, being cut into plank by sawmills erected in a gulf never before approached by a wheeled carriage.

WIDTH.

A single track of plank, eight feet wide, with an earthen turn-out track beside it, of twelve feet, will in almost all cases be sufficient. This gives twenty feet for the least width necessary between the inside top lines of the ditches, the width of which is to be added, making about two rods on level ground. If extra cuttings or fillings be required, the width occupied by their slopes must be added to this.—An earthen road of eight feet wide on each side of the plank track, has sometimes been adopted. The New York general plank road law fixed four rods (66 feet) as the least permissible width that plank roads might be laid out. This provision has since been repealed.

Wider plank tracks were at first employed. In Canada *single* tracks were made from 9 to 12 feet wide. But it was found, on the 12-feet Toronto road, after seven years' use, that the planks were worn only in the middle seven or eight feet, and that the remaining four or five feet of the surface had not even lost the marks of the saw. One-third of the planking was therefore useless, and one-third of the expenditure wasted.

A *double* plank track will rarely be necessary.—No one without experience in the matter can credit the amount of travel which one such track can accommodate. Over a single track near Syracuse, 161,000 teams passed in two years, averaging over 220 teams per day, and during three days 720 passed daily. The earthen turn-out track must, however, be kept in good order, and this is easy, if it slope off properly to the ditch, for it is not cut with any continuous lengthwise ruts, but is only passed over by the wheels of the wagons which turn off from the track, and return to it. They thus move in curves, which would very rarely exactly hit each other, and this travel, being spread nearly uniformly over the earth, tends to keep it in shape rather than to disturb it.

If, however, there is so much travel that the earth track will not remain in good order, then this travel will pay for the double track which it requires. But this should be made in *two separate eight-feet tracks*, and not in one wide one of 16 or 24 feet, as was at first the practice. On a wide track the travel will generally be near its middle, and will thus wear out the planks very unequally, besides depressing them in their centre, and making the ends spring up, and when it passes near one end that will tilt up, and loosen the other. Besides, when a light vehicle wishes to pass a loaded one moving in the centre, as it naturally will, the former will be greatly delayed in waiting for the other to turn aside, or else will have one wheel crowded off into the ditch. But where there are two separate tracks, the whole width of one is at the service of the light vehicle. On a sixteen-feet track near Toronto, the planks having become loose and unsettled, were sawn in two in the centre, and this imperfect double track, even without any turn-out path between worked better than its original state. An experienced constructor states that if he were desired to build a road fifty feet wide, he would make it in seperate eight-feet tracks.

A wide track of 16 feet plank has sometimes been divided into two of eight feet, by spiking down scantling 20 feet long, and six inches square, along the middle of the road, at intervals of 100 feet in the clear, between each scantling. This, however, only partially remedies the objections adduced.

When the ground is of such a very unsettled and yielding nature, such as loose sand, marsh, &c., that a solid turn out track of earth cannot be made, planks, sixteen feet long, may be used, resting on three, four, or five sleepers, crowning in the middle three or four inches, and the ends sprung down, and pinned to the outer sleepers.

To be continued.

We commence below, the republication of a portion of an exceedingly interesting article which appeared in the Edinburgh Review, upon the subject of railways. The article was afterwards published by itself, with a preface, explanatory of the object of the article with which we commence our first extract. It goes on to show what railroads should be, to fulfil the mechanical, commercial, and moral condition, essential to their prosperity.

Mechanically.

1. That the drainage be efficient, and the substructure firm.

2. That the sleepers, whether of wood, or stone, or metal, should possess sufficient bearing surface to prevent their crushing into the ballast beneath the rolling loads.

3. That the surface-bearing of the rails on the sleepers should be as continued and extended as practicable.

4. That the rails should be of such a section in vertical depth, that the maximum load on them may not induce deflection.

5. That the rails should be of a width proportioned to the loads rolling over them, increasing the breadth as the load increases, on the same principle that a broad wheel is used with a heavy wagon on a highway. And that in case it be found advantageous to run very heavy engines, the upper surface of the rails should be steeled to resist abrasion.

6. That the joints of the rails should be so secured as to be immoveable beneath the rolling loads, yet permitting free expansion, and contraction, so that there be no deflection, but an equable surface throughout.

7. That on curves the rails should be bent by a machine, so as to prevent the occurrence of tangential lines and sinuosities.

8. That the maximum weight on the wheel tyres of the engines and carriages should be considerably within the limit tending to produce deflection or abrasion of the rails, or crushing of the sleepers or substructure, or the treading out of the tyres. Neglect of this causes enormous waste of steam power.

9. That the construction of the engine should be so arranged as to keep the centre of gravity low, and the base extended, in order to prevent mischievous and dangerous oscillation.

10. That the carriages and the wagons should pe made as long and as wide as the curves and the width of the railway will permit, in order to prevent oscillation, and to economise space, material, and labor in working.

11. That each carriage or wagon should maintain steadiness by its length, without trammeling the wheels, which should be free to move laterally, to suit the curves or inequalities of the rails, and avoid friction.

12. That the wheel tyres should be made of dense iron or of steel, so as not to be subject to wear, and that they should be kept as light as may be consistent with strength, in order to diminish centrifugal action. That the section of the tyres should be such as to permit their application to the wheels by pressure, without heating and cooling and that the fastenings should not require the piercing of holes through the tread of the tyre, which is a source of great risk. That the wheels should be solid discs of timber or of blate iron, in order at all times to preserve a true circular form, and prevent the fanning action produced by open spokes at high speed, which helps to waste steam power and retard the train.

13. That the wheels should be free to revolve on the axle, and the axle in the boxes, permitting four movements, thus ensuring the minimum of friction, and diminishing the chance of heating. That the lubrication of the axles in the boxes should be ensured by their revolving in a bath of grease or oil, in constant contact with the lower side.

14. That the springs should be thoroughly flexible and elastic, to prevent all blows or shocks between the carriages and the rails; and that the wheels under each carriage should be sufficiently numerous to prevent any injurious oscillation from acting on a single spring.

15. That the breaks applied to retard the carriages and trains should not so act on the wheels, as to make the wheels sledge or slide on the rails, but that the retarding force necessary to absorb the momentum should be produced by friction between the breaks and the rails directly, thus to prevent the rails from being destroyed at the joints and driven out of the chairs or attachments. Stations should be on elevations, to faciliate starting with little steam pressure, and stopping with little use of the breaks.

16. That every separate carriage and wagon should be provided with traction and buffer springs to prevent snatches and concussions in starting and stopping.

17. That trains ought never to be increased in the number of carriages or wagons, so as to require enormous traction and buffer springs.

18. That the whole of the rolling structures should be as light as may be consistent with strength.

19. That no carriage or wagon should have a greater load on a pair of wheels than is placed on the driving wheels of the engine.

20. That Tank engines of very large size, used without Tenders for fuel and water, should not be permitted, being more mischievous to the road than the Tender engines. The tender was originally a contrivance to relieve small engines of their weight. To add the weight to engines already too heavy, is a most wasteful contrivance.

Commercially.

1. The more frequent the trains the better the public will be served.

2. Light engines and trains, *i. e.*, small engines and large carriages, can be worked more economically than larger engines and long trains.

3. The same principle applies to light goods viz., frequent despatches and fast travelling, precisely as the town carriers now work their traffic.

4. A kind of man-handling of goods wagons is wasteful. Long and large wagons should be drawn by engine power into stations under sheds, with alternate lines of rails and ordinary highways, and discharged by cranes like canal boats. Short wagons, man-handled, are very expensive railway stock.

5. Short lines in the environs of towns, should be worked by small five minutes' trains, like omnibusses. Passengers do not object to wait for the next train when the trains are in quick succession.

6. That highways may, in many cases, be advantageously laid down with rails for horse transit on the same guage, to communicate with branches or main lines of railway.

7. That landowners may, with great advantage, construct cheap lines through their own estates, on which to place their farms.

8. That in many cases it would be for their advantage to *give* the land needful to construct lines of railway.

9. That when the traffic of both goods and passengers is desired in maximum, the true mode is to make two lines for passengers and fast traffic, and a third line for goods and slow traffic, and to provide also a parallel line of highway close to it.—The North Woolwich Branch of the Eastern Counties line is a sample of this. Being obliged, by act of Parliament, to make a parallel highway, the directors are precluded from charging too high prices, and streets of houses are gradually accumulating. At no great distance of time this line will be a railway through a town on the same level. Future towns will be thus constructed.

For the accommodation of the wealthier classes, willing to pay for speed and accommodation, it would be desirable to institute *subscription trains* of great lightness and speed, carrying, say seventy to one hundred first-class passengers, with light luggage, and accommodation for a few servants.

A train of this kind, consisting of an engine and tender, break van, with accommodation for fourteen servants and luggage, and a light first-class for sixty-four passengers, would cost, as it appears by a document put into our hands, £2,200. It would travel at fifty miles per hour without stopping, and do one hundred miles per day. The total expense for 600 miles per week throughout the year would be less than £1,000, including interest at five per cent., coke, oil, grease, charges, repairs, and depreciation. This is about thirty shillings per train.—Take, for example, the Brighton line. There are many gentlemen who would travel backwards and forwards every day if they could do it in two hours, and employ the travelling time in reading or writing. Seventy-eight pounds per annum would be just two shillings and sixpence each journey. Now supposing each seat numbered, and an ivory ticket, *transferable*, issued, to the taker of the seat, it is probable that in some cases three persons would club to take a ticket amongst them for two days per week each. The profit to the company by such an arrangement would be enormous.

Total revenue first year say	£5,000
Total outlay for first year in capital and expenses	3,200
Profit	£1,800
Revenue second year	5,000
Expenses	1,000
Profit	£4,000

This principle is used in what are called excursion trains, making the transaction a certainty to the company; and there is no doubt that it might be carried on extensively. A company of gentlemen might surely take their railway carriage on job, as an individual does his private carriage, or as a house is let by the year.

A train of this kind might be run from London to Liverpool, and *vice versa*, in five hours, starting at 7 A. M. ad arriving at noon; starting again at 6 P. M. and arriving at 11, would leave six hours interval in London or Liverpool for business. This, with a carriage fitted for reading and writing, and with not more than five stoppages to water and coke and without loss of time in ticket collection, would surely be a great advantage to the higher order of the mercantile community.

Supposing the rent of a seat to be £250 per annum for two persons jointly, the annual revenue from 64 would be		£16,000
First cost of two trains, say	£5,000	
First year's expenses, say	4,000	
		9,000
Profit		£7,000
Revenue, second year		16,000
Expenses		4,000
Profit		£12,000

Maintenance of way with such light weights would be practically *nil*.

Large roomy seats with folding reading desks are contemplated in this arrangement. Eight separate bodies to the carriage.

The remaining problem is—are there sixty-four first class merchants in London and Liverpool who would set their hands and seals to such an agreement between themselves and the company? Or if not, how otherwise, and what annual sum would they give? Fast travelling can be had at a moderate price if the customers can be made permanent.

Morally.

1. Tha the public should never be regarded as a mere "oyster," or a paying machine, without claims to justice.

2. That the public should be used as a tradesman uses his permanent customers—fairly.

3. That the public should consider the welfare of the shareholder, who ought to have interest for his money.

4. That in the question of alteration of times and prices, faith should ever be kept with the public, and no advantage taken for the purpose of exorbitant gain.

5. That no exorbitant charges should be made, as tending to incite mischievous competition.

"*Vires acquirit eundo*"—gathering strength as it goes—onward marches the railway system, gradually sloughing off the old and effete—the practice proven defects—and replacing them with newer and more efficient appliances, some of a permanent and some of an ephemeral character, but always progressive. And, in truth, throughout all the arts of life we get very much of the knowledge of what will do, by successive trials of what will not do. And this truth even Mr. Watt frequently proclaimed of his own mechanical doings, when in the social circle. Of the waste of capital involved in railway making we do not care to speak much, save as a warning for the future. "Gone is gone;" but the real waste has in truth been small. Changing hands has been the chief phenomenon, and tho' it is pitiable to think that the trust property of the widow and the orphan should pass over to Hudson—who, after all, was but a mock King of Railways by the aid of juggling financiers—still they were to blame who purchased railway shares for them at absurd premiums. And as for those who took shares in lines with the idea of a firm and safe ten per cent. interest, without labor, and managed by unpaid directors, we can but wonder at the ignorance that imagined such a thing possible while public securities yielded but three-and-a-half, and iron and coal were lying side by side in unlimited quantities, and surplus laborers crying out for employment. It is written that man *shall* earn his living by the sweat of his brow—or of his brain; and although some few jugglers contrive to evade this law, and cheat themselves of happiness while cheating their neighbors of a livelihood, still this cannot be done in the mass. There is no ten per cent. on free capital to be had; it must be worked hard for, or a monopoly of some brain-work must be obtained to procure it as a tribute. Otherwise, why should mankind pay tribute? * * *

In the civil engineering of railways, abridging distance between distant points is one main consideration; and the chief works of construction for this purpose are tunnels, viaducts, and bridges, the latter being a technical abbreviation from the verb to *abridge*. Tunnels are a comparatively simple affair, a mere question of time and work. Bridges and viaducts are works of structure, requiring skill and science of the highest kind to achieve perfection therein, bearing in mind two objects, the minimum cost of construction, with the maximum of durability.

Bridges can only be of seven kinds:—1. Arches self-contained, as in a semicircular form. 2. Arches segmental or elliptical, depending on abutments for support. Both these arches depend for support on their power of resisting compression of their particles. 3. Girders self-contained, the upper portion resisting compression with the tension of the lower portion for an abutment. 4. Counterbalanced girders or levers, resting on piers at their centres, in which case the compression is at the lower side, and the tension at the upper. 5. Girders of the lever form firmly fixed upon heavy abutments, with their lightest ends meeting together over the space. 6. Tension bars, tightly stretched between opposite heavy abutments. 7. Catenarian or suspension bridges, consisting of slack chains passing over lofty piers, and sustained by counterbalancing abutments.

The advent of railways, and the multitudinous circumstances with which they had to deal, in crossing over rivers, and under and over canals and roads of all kinds, requiring the minimum of headway, gave rise to the large adoption of the girder bridge, which, in its many ramifications, may almost be considered as *the* railway bridge, *par excellence*. Cast-iron girders, with their lower webs considerably larger than their upper, was the first arrangement for small spans. As knowledge grew, this imperfection was amended by wrought-iron tension rods below. Then came in the wrought-iron girders, the earliest sample of which was the lattice bridge. A bridge of this kind, by Sir John Macneil, the ends being counterbalanced by masses of cast-iron, may be seen spanning the canal on the line from Dublin to Drogheda. This lattice bridge, depending wholly on uncertain rivets, is the worst form of wrought-iron girder that could be devised.

The next step was the wrought-iron box girder formed of boiler plate riveted together as a rectangular tube. This has been followed up by the hollow tubular girders spanning the Conway and Menai. In all these girders the principle really involved is that of a roof truss—*i. e.*, the tie-beam or plate below serves as a tension fulcrum for the rigid arch or rafters to abut on. For the essential principle is, that if the girder be parallel top and bottom, it should be of great depth to resist cracking, or that it should be arched to some extent, precisely as the roof, the rafters of which are the most vertical, has the greatest strength of resistance to the vertical load. The bridges of the most important forms may be thus classed:

To be Continued.

Delaware and Hudson Canal Co.

Annual Report.

Below we give the substance of the last annual report of this company. The following is a statement of the business of the company for the past year, ending March 1, 1850.

To coal on hand March 1, 1849	$210,339 65
Mining coal	276,220 36
Railroad transportation and repairs	216,154 21
Freight of coal to Rondout	441,632 31
Canal repair and superintendance	89,158 44
Labor and expense at Rondout	50,532 13
Interest on State stock	13,500 00
Rent, salaries, current expenses, etc., N. Y.	16,599 72
Balance	843,476 01
	$2,157,612 83

By sale of coal	$1,817,819 14	
Canal and railroad tolls.	34,817 95	
Interest received, profits of barges, real estate, etc	131,172 24	
Coal on hand	173,803 50	
		$2,157,612 83
Balance		$843,476 01

which is over 16¼ per cent. on the capital stock of the year.

The following is a statement of articles transported on the Delaware and Hudson canal during the year 1849.

Merchandise, 16,927; plaster, 820; cement, 18,596; tanner's bark, 659; leather and hides, 4,339; stone, brick and lime, 2,960; millstones, 200; lath, staves and hoop-poles, 550; manufactures of wood, 1,734; glass and glass ware, 799; charcoal, 1,583; sundries, posts, rails, pig iron, etc., 4,345; coal screenings up canal, 748—total tons, 54,260. Cords of wood, 328; number of shingles, pine 105,000; do. hemlock, 462,500; ship timber, in cubic feet, 49,900; hard wood lumber, in board measure, 2,226,691; pine, do. do., 783,380; hemlock, do. do., 5,435,833.

The following is a statement of tolls received on the Delaware and Hudson canal and railroad in each year since the completion of the works.

1830	$16,422 44
1831	20,554 64
1832	28,717 51
1833	37,004 58
1834	36,946 07
1835	41,976 82
1836	45,154 73
1837	44,832 42
1838	40,328 38
1839	40,095 26
1840	35,450 46
1841	39,388 19
1842	33,894 93
1843	30,996 53
1844	33,525 61
1845	25,890 92
1846	26,068 65
1847	38,971 34
1848	46,548 54
1849	44,817 95
	$697,575 97

The company's stock of coal on hand at Rondout and New York, on the 1st March, 1849, was 44,903 tons (9,492 tons more than on the 1st March 1850) and during the past year 451,012 tons were brought down the canal, making the total supply of Lackawanna coal for the year 495,915 tons.

The work on the enlargement was promptly resumed at the close of navigation, and has been successfully prosecuted under much more favorable circumstances than the previous winter, and it is now so forward as to give assurance that the canal will be ready for the navigation of the large boats throughout, at about the usual time, leaving only an inconsiderable amount of work to be done on the trunk of the canal the ensuing winter, to provide six feet depth of water.

Some changes have been made, both in the line of the work and in the location of locks, by which the efficiency of the navigation is greatly improved.

An arrangement has been entered into with the Pennsylvania coal company by which this company will receive and market all their coal on tide water charging them with a proportionate amount of all expenses, and a commission in sales: such an arrangement is deemed beneficial to the interests of both parties.

The business of that company will commence in May with 250 large class boats, fully equal to the transportation of 250,000 tons of coal, which is the quantity they are preparing to furnish this year.

The last loan on the credit of the State of New York for $300,000 fell due the 1st of January, and has been paid, which frees the company from debt.

Preparations have been making since the close of navigation to resume and prosecute the company's business with renewed energy on the opening of the canal, with an increased number of boats, many of them of the large class, and with the expectation of increasing our supply of coal at market over the last year.

Institution of Mechanical Engineers.

ON THE SYSTEM OF VENTILATION IN THE WALLSEND COLLIERY.*

By Mr. D. Burn, Newcastle.

The Wallsend colliery is situated about 3½ miles to the east of Newcastle-upon-Tyne. It is celebrated for having been the source of immense wealth to its late proprietors; and from the acknowledged superiority of the coal produced from this mine, arose the practice of appending the term "Wallsend" to such coals as were considered suitable for household purposes, indicating the class to which they belonged.

The seam of coal known by the name of the "Bensham seam," is found in this colliery, at the depth of 445 fathoms from the surface. Since the opening out of this seam, twenty-nine years ago, there had been several explosions of fire-damp, attended with a great loss of life, fully, but unhappily, entitling it to the appellation of a "fiery mine." In the course of working this seam, the following explosions and loss of life have occurred, from its opening to the present time:—

In 1821	1 explosion	52	lives lost.
In 1832	1 "	1	"
In 1835	1 "	102	"
In 1838	1 "	11	"
Total	4 explosions	166	lives lost.

The total thickness of the seam is 5 feet 8 inches, and it is divided by a band 8 inches thick, consisting of argillaceous shale and splint coal, the coal being 3 feet thick above this band, and 2 feet thick below it; the roof consists of argillaceous shale.—The quantity of coal raised annually from this seam is about 68,000 tons; but this quantity is considerably less than the powers and means of the colliery are capable of producing, owing to the present depressed state of the coal trade. There are generally employed in the mine at one time about 210 men and boys, and 15 horses. Another seam of coal, the "high main seam," is situated 34½ fathoms above the "Bensham seam;" this was first opened out in 1781, and it was abandoned in 1831. During that period, five explosions occurred in working the seam, causing the loss of 26 lives.

There are five shafts sunk to the Bensham seam. By two of the shafts the air descends into the mine—and, after circulating through the workings in the manner hereafter described, it ascends by the other three. A furnace is constantly burning at the bottom of each of these three ascending shafts, to produce the draft of air, and keep up an uninterrupted ventilation. These furnaces are 8 feet wide and 6 feet long, and each of them consumes about 1½ tons of coals per day. The descending shafts vary from 7½ feet to 10 feet in diameter, and the ascending shafts from 5½ feet to 8 feet in diameter.

The workings of this mine are divided into nine districts, which have in most cases distinct currents of air for their ventilation, and are in some degree unconnected with each other; a system which was carried out to a great extent in this colliery by the late Mr. John Buddle.

The following are the particulars of the quantity of air that is circulated thro' each of the districts. The currents were measured with Biram's patent anemometer; and on the day of measuring the quantity of air passing in each of these currents, the barometer at the surface stood at 29·35 inches, and the thermometer at 53°; the wind southeast, morning dull, with the appearance of rain.

In the following description, the "pillar workings," are where the whole of the remaining part of the seam of coal is in course of being extracted.—The "air crossings," where one current of air crosses another current, consist of a brick arch, or a timber erection, by means of which one current of air passes underneath, and the other current above, without any communication between the two currents.

The column of air descending the shaft, supplying the first five districts, consists of 75,960 cubic feet per minute, and is distributed in the following manner:—At a short distance from the shaft the first division of this current takes place; 22,010 cubic feet of air per minute is carried into the first district, which, after ventilating the passages on the west side and the workings at the northern extremity, is again divided; 10,400 cubic feet per minute passing to the first upcast shaft and over its furnace, and the remaining quantity of 11,610 cubic feet per minute, passing into and circulating through the workings forming the second district. On leaving this district, and entering the third district, it is joined by another current, diverted from the main column of air, and consisting of 10,500 cubic feet per minute; this augmented current is then carried through the workings of the third district, and thence over the furnace at the bottom of the third upcast shaft.

The remaining quantity of the principal column of air from the first shaft, now reduced to 43,450 cubic feet per minute, is again divided, where 15,750 cubic feet per minute passes into the fourth district, ventilating the pillar working, descending and passing from thence into the third shaft by an inclined drift, entering the shaft at the height of about 60 feet from the bottom, and consequently not passing over the burning furnace. The passing of this current of air into the shaft without its coming into contact with the furnace, is rendered necessary from its being on many occasions mixed with fire-damp, or carburetted hydrogen, to the exploding point, caused by the discharge of this gas from the falling of the roof, and eruptions from the thill or underclay of the coal seam.

Of the remaining column of air, 7,500 cubic feet per minute is carried eastward, and along the pipe drift or gas drift, to the upcast shaft, diluting in its passage the leakages of gas from the stoppings or walls sealing up the dormant or pipe district, and the discharge of gas from the old workings near its southern exit to the shaft. And 20,200 cubic feet per minute is passed through the workings of the fifth district, and thence to the third upcast shaft; 7,200 cubic feet of which passes over the burning furnace, and the remaining 13,000 cubic feet per minute enters the bottom of the shaft without passing over the fire.

The following is a summary of the different divisional currents of air comprised in the aggregate column descending the first shaft:—

	Cubic feet per minute.
1st and 2d districts	22,010
3d "	10,500
4th "	15,750
5th "	20,900
Pipe-drift to the second shaft	7,500
	75,960

The quantity ascending the F shaft being as follows:

1st, 2d and third districts	22,110
5th district	7,200
The quantity passing over the fire being	29,310

Add the quantity passing over the shaft without going over the furnace:—

4th district entering the shaft by the inclined drift mentioned before	15,750
5th district entering at the bottom of the shaft	13,000
Total quantity ascending the F shaft	58,060

The column of air descending the D shaft consists of 45,400 cubic feet per minute, and is diverted into the following districts, according to A and B upcast shafts:—

	Cubic feet per minute.
The quantity of air passing into the sixth district, ventilating the workings on both sides, and carried to the B upcast shaft	17,400
The quantity of air carried into the seventh district and pillar workings, P, and passing by an inclined drift into the A upcast shaft, evading the furnace	16,800
The quantity passing through the workings of the eighth district, and mixing with the various discharges of gas from the old workings, T T, in its course to the A shaft, being also joined by the current from the seventh district before arriving there	11,200
Total quantity descending the D shaft	45,400
" descending the C shaft	75,960
Making a total quantity of air descending into the Bensham seam of	121,360

	Acres.
The area of the coal field which this system of ventilation comprises is about	400
The area of the workings of the ninth district, which are isolated and closed up to the gas pipe in the C shaft, as described afterwards, is about	50
Total acres	450

The total length of passages, or air-channels, ventilated by the currents of air already enumerated, amount to about 24 miles in the C pit workings, and 7 miles in the D pit workings.

The total quantity of air circulating through the passages of this mine amounts to 174,758,400 cubic feet per day; and the cost of working the furnaces, including their consumption of coals, amounts to 19s. 1d. per day, or £347 per annum.

The ordinary changes of the atmosphere, as indicated by the barometer, have not the effect of charging any of the currents proceding from the workings of the whole mine (or air passing over the furnaces), with fire-damp in an appreciable degree; but, under like circumstances, the currents from the pillar workings and the pipe drifts are generally heavily charged with carburetted hydrogen, relieved by the change of atmospheric pressure from its vast magazines or gasometers formed by the total removal of the seam of coal.

In the same seam of coal, and situate to the east and south of the C shaft, is the ninth district, colored green on the plans, which is a district of workings lying dormant, being closed off from the ventilated part of the mine by a line of stoppings or substantial brick walls. The only exit for the gas generated in this district is a pipe, O, carried up in the C shaft to the surface, where the gas burns with great brilliancy. When last measured, the quantity issuing from this pipe was found to be about 95 cubic feet per minute; an amount nearly equa

* In this paper various literal references are made to illustrate drawings; and, although we are not in possession of these drawings, we have retained many of the references as guides to the comprehension of the details of the shafts.

to half the consumption of the town of Newcastle.

To be continued.

AMERICAN RAILROAD JOURNAL.

Saturday, April 6, 1850.

FOWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,

EATON, GILBERT & CO.

—

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders. Yours truly, S. M. FELTON,

Supt. Fitchburg Railroad.

—

Office of the New Jersey Railroad Co.,
Jersey City, March 7, 1850.

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Prest.
New Jersey Railroad and Trans. Co.

—

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The *cold weather* does not affect *them*, as it has *other* rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,
GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

—

Supt. Office N.Y. & H. R.R.,
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use

M. SLOAT, Supt.

—

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies. DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

—

Harlem R.R. Depot,
New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried. J. M. SMART,
Foreman at 42d St. Depot.

American Railway Guide,

AND POCKET COMPANION FOR THE

UNITED STATES;

CONTAINING Correct Tables, showing the time for starting of trains from all stations, distances, fares, etc., on all the Railway lines in the U. States; also many of the principal Steamboat and Stage routes—accompanied by a complete RAILWAY MAP. Price, single copies 10 cts., or $1 per annum. Published on the first of every month, corrected from returns furnished by the Railway Superintendents throughout the Union.

This book has been compiled somewhat on the plan of Bradshaw's Guide, with such improvements in size, form and arrangement as have seemed desirable; and the publisher confidently hopes it will not be found liable to the objections of incompleteness and incorrectness, which have been made, and justly too, against various other similar works heretofore issued.

The subscriber having had the management of the NEW YORK PATHFINDER almost from its commencement, has enjoyed superior facilities in obtaining information relating to the thoroughfares of travel, and is therefore well qualified to prosecute with success the arduous undertaking of furnishing a complete and correct national guide book.

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Pacific Railroad.

PHILADELPHIA CONVENTION.

We have received the proceedings of this convention held on the 1st inst. We have not room for the proceedings this week, but shall give them in our next. W. B. Ogden, of Chicago, acted as President of the convention.

Connecticut.

A charter has been obtained and a company formed, for the construction of a railroad from Willimantic to New-Boston. The charter requires $200,000 to be subscribed before the organization of the company. This sum has been subscribed, and the company has been organized by the election of the following directors; Alfred Smith, Calvin Day, W. S. Lee, James M. Bunce, W. D. Ely, E. D. Amidon, H. N. Slater, W. Farnum, and Amasa Carpenter. Hartford subscribed $15,000 North and South Woodstock subscribed $20,000; liberal subscriptions were received from other places on the route, and the Hartford, Providence and Fishkill railroad companies has subscribed $190,000.

Columbus and Lake Erie Railroad Co.

At the annual meeting on the 21st ult, the following named persons were elected directors of this company:—J. Dille, A. J. Smith, Thomas Blanchard, S. M. Knowlton, S. Corning, James L. Birkey, James R. Stanbery, John D. Struble, Robert Graham, Daniel S. Norton, C. T. Sherman, Miller Moody, and Geo. W. Penney.

J. Dille, President.

A. J. Smith, Treasurer.

Geo. W. Penney, Secretary and Superintendent.

J. W. Webb, Chief Engineer.

A gentleman connected with the road writes us thus,—"we shall commence laying iron on our road the first week in April, and by the middle of May, if the weather is favorable, run trains to Belville, 14 miles south of Mansfield, on the first day of Sebtember expect to run trains to Newark, 116 miles from Sandusky city.

Annual of Scientific Discovery.

Messrs. Gould, Kendell and Linch, of Boston have published a work of about 400 pages, 12 mo., entitled the ANNUAL OF SCIENTIFIC DISCOVERY; or year book of facts in science and art, edited by David A. Wells and George Bliss, Jr. It is ornamented by a portrait of Prof. Agassiz, and the typographical execution does credit to the publishers.

With every disposition to speak favorably of any work got up for the purpose of recording the facts of science and art, we feel inclined to caution the editors against their too ready adoption for facts, in science, the hasty conclusions of interested parties. In fact, we cannot regard the work as any thing more than a scientific scrap book, in which are collected together the various statements put forth during the past year, in regard to science and art. These items, scattered through the columns of the newspapers and periodicals, have been very well arranged, and many of them abridged from their original dimensions. Probably a large portion of the articles have been published in all the leading newspapers of the great cities, many of them certainly in this Journal; but from the want of an index to the newspapers, the larger portion of the matter is practically lost.

Without a particle of knowledge as to the editors of this work in question, we see plainly, on every page of the book, evidence that they can claim very little acquaintance with the practical details of any department of science or art. Their book has been taken up and published as facts, the exaggerated statements of unskilled pretension and the inflamed advertisements issued by the owners of new patents.

A book of this sort should be subjected to the severe tests of tried experience and the judgment of practical men. Instead of this, they are too ready to admit for truth whatever "*has been printed in the newspapers!*"

Take, for example, on page 259 the extracts from a letter, "on the quicksilver deposits of California," published in the *Merchant's Magazine*, written by Dr. Fentchwarger—"Rocks and mountains to the height of several thousand feet have already been found *to consist of nothing but cinnabar and many more will be undoubtedly developed etc.*"

Statements of such an exaggerated character may be paraded in a periodical of the day, whose business it is to note the progress of discovery and call forth suggestions in every form;—but to see them finally recorded as settled conclusions in a

work claiming to give scientific results in an authoritative form, bespeaks too much the spirit of new book making.

The work entirely omits a vast number of most valuable inventions brought to public notice, or into use the past year. Dick's anti-friction press, Lightner's axle boxes, etc., are not named in the work, while the description of many patents of very little practical value, are introduced.

We might fairly pursue this topic further, but we forbear. The general aim and scope of the work is praiseworthy, and it may yet become in future years, a valuable record of the facts of science and the useful arts.

For the American Railroad Journal.

Modulus of Strength for Bridge Trusses.

Let l = length of truss, t = weight of truss, and w = the greatest distributed weight the truss can bear; then $\frac{t+w}{t} \times l$ = a number which is constant for all trusses of the same plan, same proportions and same materials, and which has the remarkable property of expressing the greatest length that such a truss could be built capable of sustaining its own weight.

This number I propose to call the *modulus of strength*, which will be very convenient, as affording a simple measure, or means of comparing the strength of different plans of trussing, by trials on models, or trusses of whatever size or length.

A bar of cast iron 1 inch square and 12 inches between supports, will bear a uniformly distributed load of about 4000 lbs., and will weigh about 3 lbs. Then, $\frac{3+4000}{3} \times 1$ ft. $= 1334\frac{1}{3}$, the modulus of strength for rectangular cast iron girders having a length equal to 12 times the depth. In the same manner we find the modulus for a girder of a length equal to 10 times its depth to be about 1601. Hence, girders of this description would be liable to break with their own weights, if of greater lengths than 1334 ft. and 1601 ft. respectively, and could not be regarded as *safe* to bear their own weights at much over one-fourth of those lengths.

Mr. Fairbairn gives $\frac{80\,a\,d}{l}$ tons = the breaking weight for the wrought iron tubular bridge, where a = the cross-section of the bottom plates in square inches, d = the depth and l = the length of the tube between supports.

This I take to be the breaking weight when placed in the centre, and it must be doubled for the load uniformly distributed over the length.

The Conway tube is 400 ft. $= l$, 25 ft. $= d$, and $517 = a$. Hence, $2\,\frac{80 \times 517 \times 25}{400} = 5170$ tons = to the breaking weight when distributed, including the weight of the tube, which is 1300 tons, or say 1250 tons for the part between supports.

Applying my formula $\frac{t+w}{t}\,l$, in this case, it becomes $\frac{5170}{1250} \times 400 = 1654{\cdot}4$ which is the modulus for the tubular bridge, and also for Mr Fairbairn's wrought iron girders, to which he applies the same formula for the breaking weight.

The modulus here determined shows that such tubes and girders could only sustain their own weight at 1654 ft., that they are a trifle stronger than rectangular cast iron girders of a length equal to ten times their depth, and that the Conway tube would sustain at the extreme, but little over four times its own weight, including its own weight.

I may hereafter give the results of further applications of the formula above given, for determining the moduli for different plans of bridges, and some of my own among the rest.

S. Whipple.

Maine.

Railroad from Bangor to Oldtown.

A. C. Morton Esq., chief engineer of the Atlantic and St. Lawrence railroad, has just completed a survey for a road to connect the above places.

The following is a statement of the estimated cost of the work.

Grading, bridging, etc. as per statement A.		$234,300
14.41 miles of main and side track, at $6,514, B.		93,867
Average cost of grading and track per mile, $23,866, Cars and engines, as per statement	C.	67,600
Station buildings	D.	18,500
Branches to accommodate mills	E.	40,984
Turning tables		5,000
Land and damages		37,000
Total cost to Oldtown		$497,251
To carry the road to Milford requires a further expenditure of		43,691
Total cost to Oldtown and Milford		$540,942

The whole length of line is 13.75 miles It follows the bank of the Penobscot river so as to accommodate the numerous lumber manufacturing establishments on the route. The whole fall between the termini of the road is 96 feet, all of which, may easily, be made available to manufacturing purposes.

The grades are favorable, all being in the direction of the traffic. The annual estimated income of the road is $118,000. Expenses $71,000 leaving $47,000 applicable to dividends: being 9 per cent on the cost.

We are somewhat familiar with the route of the proposed road, and the resources of the line, and we have no doubt that if the road could be built it would pay well, but we presume that the heavy cost of the work will be at present an insuperable objection to its construction. We think that this road is of much more consequence to Bangor and the adjoining towns, than the proposed road to Waterville, as it would bring into use and notice, the magnificent water power of the Penobscot and stimulate the growth of manufacturing towns along its line.

California.

T. Butler King's Report.

We give in another column, that portion of a very elaborate report recently made by Mr. King, descriptive of the mineral resources of California. Mr. King's statements are fully up to the most extravagant reports that have yet come from that quarter, and if correct, California is certainly the richest country in the world, in mineral wealth.

The report gives a very favorable view of the resources of that country in all respects; and great credit will be attached to it from the fact that Mr. King was sent to California for the purpose of presenting to government a correct and authentic statement of its resources, climate, etc. It will give a new impulse to the vast tide of emigration which is setting in that direction; and but two or three years will elapse before California will, in population, take a respectable position, not only in wealth but in population among the old States of the Union.

Mr. King estimates the value of gold collected up to January 1, 1850, at $40,000,000, and the am't which will be obtained this year at $50,000,000.—He thinks the supply, from all appearances, to be inexhaustible. If he is correct in his calculations, the immense addition of gold from this quarter must affect its value as a medium of exchange.—History furnishes no other instance of so great an addition of the precious metal to the old stock in so short a time.

The result, thus far, must have convinced the most sceptical of the richness of California, in surface washings. But whether the vein mining is to be profitable remains to be proved. Opinion is worth but little here. Gold mining is proverbially delusive and uncertain in its results. And it by no means follows because surface washings are profitable, that after these are exhausted, working the vein stone is to be equally so. Mr. King says:

"The gold region of California is between four and five hundred miles long, and from forty to fifty miles broad, following the line of the Sierra Nevada. Further discoveries may, and probably will, increase the area. It embraces within its limits those extensive ranges of hills which rise on the eastern border of the plain of the Sacramento and San Joaquin, and extending eastwardly from 50 to 60 miles, they attain an elevation of about 4000 feet, and terminate at the base of the main ridge of the Sierra Nevada. There are numerous streams which have their sources in the springs of the Sierra, and receive the water from its melting snows, and that which falls in rain during the wet season.

These streams form rivers, which have cut their channels through the ranges of foot-hills westwardly to the plain, and disembogue into the Sacramento and San Joaquin. These rivers are from ten to fifteen, and probably some of them twenty miles apart.

The principal formation, or substratum, in these hills, is talcose slate; the substratum, sometimes penetrating to a great depth, is quartz. This, however, does not cover the entire face of the country, but extends in large bodies in various directions—is found in masses and small fragments on the surface, and seen along the ravines, and in the mountains overhanging the rivers, and in the hill-sides in its original beds. It crops out in the valleys and on the tops of the hills, and forms a striking feature of the entire country over which it extends.—From innumerable evidences and indications, it has come to be the universally admitted opinion among the miners and intelligent men who have examined this region, that the gold, whether in detached particles and pieces, or in veins, was created in combination with the quartz. Gold is not found on the surface of the country, presenting the appearance of having been thrown up and scattered in all directions by volcanic action. It is only fonnd in particular localities, and attended by peculiar circumstances and indications. It is found in the bars and shoals of the rivers—in ravines, and in what are called the dry diggings.

The rivers, in forming their channels, or breaking their way through the hills, have come in contact with the quartz containing the gold veins, and by constant attrition cut the gold into fine flakes and dust, and it is found among the sand and gravel of their beds at those places where the swiftness of the current reduces it, in the dry season, to the narrowest possible limits, and where a wide margin is, consequently, left on each side, over which the water rushes, during the wet season, with great force.

As the velocity of some streams is greater than others, so is the gold found in fine or coarse particles, apparent by corresponding to the degree of attrition to which it has been exposed. The water from the hills and upper vallies, in finding its way to the rivers, has cut deep ravines, and wherever it came in contact with the quartz, has dissolved or crumbled it to pieces.

In the dry season these channels are mostly without water, and gold is found in the beds and margins of many of them in large quantities, but in a much coarser state than in the rivers; owing, undoubtedly, to a moderate flow and temporary continuance of the current, which has reduced it to smooth shapes, not unlike pebbles, but had not sufficient force to cut it into flakes or dust.

The dry diggings are places where quartz containing gold has cropped out, and been disintegrated, crumbled to fragments, pebbles, and dust, by the action of water and the atmosphere. The gold has been left as it was made, in all imaginable shapes; in pieces of all sizes, from one grain to several pounds in weight. The evidences that it was created in combination with quartz are too nnmerous and striking to admit of doubt or cavil. They are found in combination in great quantities.

A very large proportion of the pieces of gold found in these situations have more or less of these quartz adhering to them. In many specimens they are so combined they cannot be separated without reducing the whole mass to powder, and subjecting it to the action quicksilver.

This gold, not having been exposed to the attrition of a strong current of water, retains, in a great degree, its original conformation.

These diggings, in some places, spread over valleys of considerable extent, which have the appearance of an alluvion, formed by washings from the adjoining hills, of decomposed quartz, and slate earth, and vegetable matter.

In addition to these facts it is beyond doubt true, that several vein mines have been discovered in the quartz, from which numerous specimens have been taken, showing the minute connection between the gold and the rock and indicating a value hitherto unknown in gold mining.

These veins do not present the appearance of places where gold may have been lodged by some violent eruption. It is combined with the quartz in all imaginable forms and degrees of richness.

The rivers present very striking, and, it would seem, conclusive evidence respecting the quantity of gold remaining undiscovered in the quartz veins. It is not probable that the gold in the dry diggings, and that in the rivers—the former in lumps, the latter in dust—was created by different processes. That which is found in the rivers has undoubtedly been cut or worn from the veins in the rock, with which their currents have come in contact. All of them appear to be equally rich. This is shown by the fact that a laboring man may collect nearly as much in one river as he can in another. They intersect and cut through the gold region, running from east to west, at irregular distances of fifteen to twenty, and perhaps some of them thirty miles apart.

Hence it appears that the gold veins are equally rich in all parts of the most remarkable section of country. Were it wanting, there are further proofs of this in the ravines and dry diggings which uniformly confirm what nature so plainly shows in the rivers.

For the purpose of forming some opinion respecting the probable amount of value of treasure in the gold region, it will be proper to state the estimates which have been made of the quantity collected since its discovery.

Gold was first discovered on the south fork of the American river, at a place called Sutter's mill, now Coloma—late in May or early in June, 1848. Information which could be relied on announcing this discovery, was not received in this city until late in the following autumn.

No immigration into the mines could, therefore have taken place from the old states in that year. The number of miners was, consequently, limited to the population of the territory—some five hundred men from Oregon—Mexicans and other foreigners who happened to be in the country, or came into it during the summer or autumn, and the Indians who were employed by, or sold their gold to the whites.

It is supposed there were not far from five thousand men employed in collecting gold during that season. If we suppose they obtained an average of one thousand dollars each—which is regarded by well informed persons as a low estimate—the aggregate amount will be $5,000,000.

It is not probable that during the first part of the season there were more than five or six thousand Americans in the mines. This would swell the whole number, including foreigners, to about 20,000 the beginning of September. This period embraced about half of the season during which gold may be successfully collected in the rivers.

Very particular and extensive inquiries respecting the daily earnings and acquisitions of the miners lead to the opinion that they averaged an ounce per day. This is believed by many to be a low estimate; but from the best information I was able to procure, I am of opinion it approaches very near actual results. The half of the season, up to the 1st of September, would give sixty-five working days, and to each laborer, at $16 per ounce, $1,040. If, therefore, we assume $1,000 as the average collected by each laborer, we shall probably not go beyond the mark.

This would give an aggregate of $20,000,000 for the first half of the season—15,000,000 of which was probably collected by foreigners. During the last half of the season, the number of foreigners was very much diminished, and, perhaps, did not exceed 5,000. At this time, the American immigration had come in by land and sea, and the number of our fellow citizens in the mines had, as was estimated, increased to between forty and fifty thousand. They were most of them inexperienced in mining, and it is probable the results of their labors were not as great as has been estimated for the first part of the season, and experienced miners assuming that the average of half an ounce per day ought to be considered as reasonable, it would give an aggregate of about $20,000,000. If from this we deduct one-fourth, on account of the early commencement of the wet season, we have an estimate of $15,000,000; at least five of which was collected by foreigners, who possessed many advantages from their experience in mining and knowledge of the country.

These estimates give, as the result of the operations in the mines for 1848 and 1849, the round sum of $40,000,000—one half of which was probably collected and carried out of the country by foreigners.

From the best information I could obtain, I am led to believe that at least $20,000,000 of the $40,000,000 were taken from the rivers, and that their richness has not been sensibly diminished, except in a few locations, which had early attracted large bodies of miners. This amount has principally been taken from the northern rivers, or those which empty into the Sacramento; the southern rivers, or those which flow into the San Joaquin, having been comparatively but little resorted to until near the the close of the last season. These rivers are however believed, by those who have visited them, to be richer in the precious metal than those in the northern part of the gold region.

There is one river which, from reported recent discoveries, and not included in the description of those flowing into the great plain west of the Sierra Nevada, is as rich in gold as any of them. That is the Trinity, which rises north of the headwaters of the Sacramento. and discharges into the Pacific not far from the fortieth degree of north latitude.

There are as nearly as my recollection serves me, twelve brincipal rivers in which gold has been found; but most of the twenty millions in the above estimate was taken from six or seven of them, where it was first discovered and most accessible.

Adopting the hypothesis that the gold found in the beds of these streams has been cut or worn from the veins in the quarts through which they have forced their way, and considering the fact that they are all rich, and are said to be nearly equally productive, we may form some idea of the vast amount of treasure remaining undisturbed in the veins which run through the masses or rock in various directions over a space of forty or fifty miles wide, and near five hundred miles long.

If we may be allowed to form a conjecture respecting the richness of these veins from the quantity of lump or coarse gold found in the dry diggings, where it appears to occupy nearly the same superfices it did originally in the rock—its specific gravity being sufficient to resist ordinary moving causes—we shall be led to an estimate almost beyond human calculation and belief. Yet, as far as I can perceive, there is no plausible reason why the veins which remain in the quartz may not be as valuable as those which have become separated from the decomposed rock. This matter can only be satisfactorily decided by actual discoveries.

The quicksilver mines of California are believed to be numerous, extensive and very valuable.—There is one near San Jose, which belongs to, or is claimed by Mr. Forbes, of Tepic, in Mexico. The cinnabar ore, which produces the quicksilver, lies near the surface, is easily procured, and believed to be remarkably productive.

Discoveries of other mines are reported, but no certain information respecting them has been made public. It is undoubtedly a fortunate circumstance that nature, in bestowing on California such vast metallic treasure, has provided, almost in its immediate neighborhood, inexhaustible stores of quicksilver, which is so essential in gold mining.

The policy of government with respect to these mines of cinnabar should, in my opinion, be quite different from that which I have felt it my duty to suggest for the management of the gold region.

As soon as the necessary explorations can be made, and proper information obtained, it will be well to offer these mines for sale, and commit their development to the hands of private enterprise.

It is believed that there are extensive beds of silver, iron and copper ores in the territory; but there is no information sufficiently accurate respecting them, to justify any statement of their existence or value.

Great American Engineering

AND MECHANICAL WORK, just published in medium folio, 75 cts.

Part III of "Specimens of the Stone, Iron and Timber Bridges, &c. &c. of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections and isometrical views of the elegant timber arch 275 feet span, at Cascade Creek, Pa. on the line of the N. Y. & Erie R. R., and of a plank bridge 100 feet span across the Mahawk River near Rome, on the line of the U. and S. R.R. with the specifications, estimates, bills of timber, iron, etc.

N.B.—This work is published by subscription of the most eminent in the engineering profession of the U. States, and will be completed in 12 parts, at 75 cents each to those who remit their names and subscriptions before the 1st May next, after which the price will be raised to $1 per part.

To those making a present remittance of $5, and the remainder $4, when they have been supplied with the first six parts, the work will be forwarded regularly as published. Parties remitting $9 shall receive it monthly POST-FREE in any part of the United States.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of $9"—[Scientific Amer. March 16, 1850.

In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to this country to exercise his profession; but finding Railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students. The work will be supplied to subscribers only, in 12 parts, at 75 cents each.—[N. Y. Journal of Commerce, Feb. 14, 1850.

Published by GEORGE DUGGAN,
172 East Broadway, New York.

CAUTION.

RAILROAD COMPANIES and others are hereby cautioned against using or vending our improvement for easing the lateral motion as applied on Railroad Cars. Letters Patent having been granted to us in 1841, any party or parties so making or using said improvement without license from us will be proceeded against according to law.

DAVENPORT & BRIDGES.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing J. W. FLACK,
March 6, 1850. Troy, N. Y.

WHISTLER MONUMENT Association.

MAJOR T. S. BROWN having, in leaving this country, resigned his office as Treasurer of this Association, the Committee appointed for that purpose have selected as his successor GEO. M. DEXTER, Esq., of Boston.

Those desiring to subscribe will therefore please direct their communications to Geo. M. Dexter, Civil Engineer, etc., Boston, Mass.

A. W. CRAVEN, Secretary, etc.

New York, February 22, 1850.

United States Railroad Guide and Steamboat Journal.

CONTAINING OFFICIAL TIME ADVERTISEMENTS, Tables of Stations, Distances, Fares, Time, etc., with much miscellaneous matter for the travelling public. Price 12 cents a copy. Yearly subscription $1. Published at 43 Ann street, New York.

Henry J. Ibbotson,

IMPORTER of Sheffield and Birmingham Goods. Also, Agent for the Manufacture of Telegraph Wire. 218 PEARL ST., NEW YORK.

F. M. Ray's India Rubber Spring.

New York and Erie Railroad Shops.
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,
HORACE B. GARDNER,
Foreman of the Car Shops.

—

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,
President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Comp'y have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffing Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,
JAS. H. MOORE,
Supt. O. C. Road.

—

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,
OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

—

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,
GEO. HAVEN,
Supt. Fall River Railroad.

Office New Jersey Railroad Co.,
Jersey City, March 8, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

1st. The cost is 30 per cent. less.

2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.

3d. Less care and attention is required, as they are not liable to get out of repair.

4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.

5th. The freedom from noise.

6th. There is greater safety in case of accident, as they cannot be broken.

7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City. Yours respectfully,

T. L. SMITH, Supt.

—

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars. Yours respectfully,

ROBERT SCHUYLER.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to CHARLES STODDER, No. 75 Kilby street, Boston, will have prompt attention.

March 23, 1850. 2m

To Contractors.

SEALED PROPOSALS will be received at the Office of the Nashville and Chattanooga Railroad Company in Chattanooga until the 20th day of May next, for the graduation and masonry of the Chattanooga Division of said Road—embracing a distance of 27¼ miles.

The graduation will be heavy for about 15 miles, (in crossing Rackoon Mountain, and passing around Lookout Mountain bluffs), the balance, average work, The masonry will consist chiefly of cut stone Piers for Tennessee River Bridge, (about 4 000 Perches,) Piers for running Water Bridge, (about 2,000 Perches), and Pier for Lookout Creek Bridge, about 500 Perches.

Sealed proposals will also be received at the same time and place, for the graduation of 10 miles of the Eastern end of the Winchester Division—embracing some heavy work. Also the masonry of Elk River and Widow's Creek Bridges.

Plans and Profiles of the Work will be exhibited, specifications furnished, and all other desired information given, on application to Mr. James A. Corry, the Engineer in charge of the work, at the Company's Office in Chattanooga, from the 10th of May until the day of letting.

Before making bids the line should be throughly examined. The depths of the Cuts and Embankments can be ascertained from the centre stakes. The work to be commenced immediately after the letting. And that portion from Chattanooga to Lookout Bluffs to be completed by the 1st of December next. The other sections to be finished successively on toward the West end of the Division—the last by the 1st of October, 1851.

The most satisfactory testimonials will be required. The payments will be made in cash—reserving the usual 20 per cent. until the completion of the work.

By order of the Board.

JAMES H. GRANT, Chief Eng.

Nashville, Tenn., March 14, 1850.

TO CONTRACTORS.

NOTICE is hereby given, that from 30 to 60 miles of the Orange and Alexandria Railroad will be ready for examination between 1st and 15th of April next. The road passes through a very healthy and fertile region, and embraces an amount of work every way worthy of the attention of able and experienced men.

The Company prefers to let the whole work of construction in contracts of not less than 30 miles, and for that purpose parties wishing further information are invited to call at the office in Alexandria.

The bids will be made on a basis of payments in cash to the amount of 85 per cent, and the remaining 15 per cent in the stock of the company. They must be sent to this office not later than the 16th day of April next, to be submitted to the meeting of the Board of Directors to be held on the 18th of the same. By order of the Board. T. C. ATKINSON,
Chief Engineer.

For the information of parties at a distance, it is well to state that the *Orange and Alexandria Railroad* is about 90 miles long, and extends from Alexandria through Fairfax, Prince William, Fauquier, Culpeper and Orange counties to Gordonsville, a point on the completed portion of the *Virginia Central Railroad*, formerly called the Louisa railroad.

An inspection of the map will show that its connections promise to make it as valuable a thoroughfare as any in the Union.

To Contractors.

THE Election of Directors of the Queenston Suspension Bridge Company having taken place, the Company are now prepared to receive Plans for the Bridge and Tenders for its erection. All communications to be directed, GILBERT McMICKEN,

1m11* Queenston, Canada W.

To Miners and Mining Companies.

THE undersigned would respectfully call the attention of those persons engaged in mineral operations on Lake Superior to the following list of articles which will be sold on accommodating terms, viz:

600 bbls. Corn fed No. 1 Mess Pork.
500 " Stall fed Mess Beef.
25,000 lbs. "Sugar cured canvassed" Hams.
2,200 " Dried Beef.
60,000 " "Kiln dried" Corn Meal,
500 bush. White "Field" Beans.
300 " "Canada" Peas.
500 " Dried Apples.
100 bbls. and half bbls. "cucumber" Pickles.
50 " Sour Krout.
30 bush. Onions.
1,000 Beefs' Tongues Smoked and in Pickle.
10,000 lbs. "Mould" Candles.
10,000 " "Hard" Soap.

Also, a full and large supply of all articles that may be required by Mining Companies and those connected with them. C. A. TROWBRIDGE,

127 Jefferson Avenue, Detroit, Michigan.

Gas Fixtures.

FIXTURES for Burning Gas for Lighting Public Buildings, Private Dwellings, Stores and Factories, manufactured by the subscriber in great variety. Orders by Mail, or left at the Factory on Causeway street, will be promptly attended to.

HENRY N. HOOPER & CO.

Boston, March 23, 1850. 6m13

Railroad Iron.

3,000 TONS C. L. MAKE 63½ lbs. per yard, now landing and to arrive.

Also contracts made for future delivery of above superior make English Iron.

300 Tons Banks Best Iron, Round, Square and Flat.
200 " English Bar " " " "
10 " 9-16 Square Iron for Railroad Spikes.

For sale in lots to suit purchasers by

DAVID W. WETMORE.

New York, March 26, 1850. 3m

Pennsylvania Railroad.

PROPOSALS will be received at Blairsville, Indiana county, until the 18th of April next, for grading the Western Division of the Pennsylvania Railroad.

The work to be contracted for, embraces three short Tunnels, a number of Stone Bridges and Culverts, and some very heavy excavations and embankments.

For further information apply to EDWARD MILLER, Esq., Associate Engineer, at Blairsville.

J. EDGAR THOMSON, Chief Eng.

Engineers' Department, Pennsylvania R.R.,
Philadelphia, March 23, 1850.

To the Proprietors of Rolling Mills and Iron Works.

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burtt, J. & J. Rogers, Saltus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849.

Arch St. Machine Shop.

BIRKENBINE, MARTIN & TROTTER,
Makers of
STEAM ENGINES,
and
HYDRAULIC MACHINERY,
NO. 16 ARCH STREET,
PHILADELPHIA,

Will construct Steam Engines, Pumps, for Draining Mines and Land; supplying Water to Towns, Factories, Farms, etc;
Also, Street Stops, Fire Plugs, Water Tanks, and Hydraulic Rams, with
(BIRKINBINE'S PATENT VALVES.)
B., M. & T. contract for Warming and Ventilating Buildings by Steam or Warm Water.

THE NEWCASTLE MANUFACTURING Co. continue to furnish at the Works, situated in the town of Newcastle, Del., Locomotive and other steam engines, Jack Screws, Wrought Iron Work and Brass and Iron Castings, of all kinds connected with Steamboats. Railroads, etc.; Mill Gearing of every description; Cast Wheels (chilled) of any pattern and size, with Axles fitted, also with wrought tires, Springs, Boxes and bolts for Cars; Driving and other wheels for Locomotives.

The works being on an extensive scale, all orders will be executed with promptness and despatch. Communications addressed to Mr. William H. Dobbs, Superintendent, will meet with immediate attention.

ANDREW C. GRAY,
President of the Newcastle Manuf. Co.

Brown's Old Established SCALE WARE HOUSE,

NO. 234 WATER ST., NEW YORK.

THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others. J. L. BROWN.

☞ Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required. 4tf

ENGINEERS.

Bancks, C. W.,
Civil Engineer, Vicksburg, Miss.

Berrien, John M.,
Michigan Central Railroad, Marshall, Mich.

Buckland, George,
Troy and Greenbush Railroad.

Clement, Wm. H.,
Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W, H.,
Engineer and Surveyor, St. Louis, Mo.

Davidson, M. O.,
Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,
Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,
Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,
South Oyster Bay, L. I.

Gzowski, Mr.,
St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,
Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,
Nashville and Chattanooga R. R., Nashville, Tenn.

Harry, P.,
Binghamton, New York.

Holcomb, F. P.
Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.
New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,
Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,
Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,
Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,
Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,
South Carolina Railroad, Charleston, S. C.

Nott, Samuel,
Lawrence and Manchester Railroad, Boston,

Prichard, M. B.,
East Tennessee and Georgia R. R., Cleveland, Tenn.

Roebling, John A.,
Trenton, N. J.

Roberts, Solomon W.,
Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,
South Side Railroad, Virginia.

Schlatter, Charles L.,
Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,
Rahway, New Jersey.

Stark, George.,
Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,
Pottstown, Pa.

Trimble, Isaac R.,
Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,
United States Fort, Bucksport, Me.

Thomson, J. Edgar.,
Pennsylvania (Central) Railroad, Philadelphia.

Whipple, S.,
Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,
Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,
Milwaukie, Wisconsin.

Wormeley, Preble,
Central Ohio Railroad, Zanesville, Ohio.

HOTELS.

JONES' HOTEL,
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DUNLAP'S HOTEL,
On the European Plan,
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Between Broadway and Nassau St.,
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METAL BROKER, 69 WALL ST., N.Y.
For the Purchase and Sale of Railroad Iron (new and old,) Boiler Plates, Pig and Bar Iron, Lead, Tin, Copper, Spelter, etc. Refers to
Messrs. Boorman, Johnston, & Co., New York.
" Grinnell, Minturn & Co., "
" Barston, Pope & Co., "
" Earps & Brink, Philadelphia.
" E. Pratt & Brother, Baltimore.
John Barstow, Esq., Providence.
Lewis Bullard, Esq., Boston.
February 9, 1850. 6m*

VanRensselaer Stevens,
Sup't Transortation Providence and Worcester R.R., Providenc, R.I. Has had 13 years' experience in Operating Railroads. Will go South or West if applied to.

J. & Riley Carr,
Manufacturers of Cast, Shear, German and Blister
STEEL,
Of all Descriptions, Warranted Good.
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R. S. DENTON, *Agent,*
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STEEL AND FILES.
R. S. Denton,
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AGENT FOR
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Manufacturers of Cast, Shear, German and Blister
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Of all descriptions. *Warranted* Good
FILES.
Manufacturers of Machinists' Warranted Best Cast Steel *Files*, expressly for woring upon Iron and Steel, made very heavy for recutting.
☞ A full Stock of *Steel* and *Files* at all times on hand. 6m4

Cumberland, (Md.,) Coals for Steaming, etc.
ORDERS by RECEIVED FOR AND FILLED J. COWLES, 37 Wall St., N. Y.

George O. Robertson,
BROKER IN SCOTCH AND AMERICAN PIG IRON;
Bar Iron, Lead, Spelter, Tin, Copper, etc.,
No. 4 Liberty Place, MAIDEN LANE,
(Near Broadway,)
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Manufacture of Patent Wire ROPE AND CABLES,
For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tillers, &c., by
JOHN A. ROEBLING, Civil Engineer,
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Samuel D. Willmott,
MERCHANT, AND MANUFACTURER OF
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IMPORTER OF THE
GENUINE WICKESRLY GRINDSTONES
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ANALYTICAL & CONSULTING CHEMISTS,
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Dudley B. Fuller & Co.,
IRON COMMISSION MERCHANTS,
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BALTIMORE.
Agents for Avalon Railroad Iron and Nail Works. Maryland Mining Company's Cumberland Coal 'CED —'Potomac' and other good brands of Pig Iron.

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F. S. & S. A. MARTINE,

IMPORTERS AND MANUFACTURERS OF

RAIL ROAD CAR & CARRIAGE LININGS,

PLUSHES, CURTAIN MATERIALS, ETC.,
112 WILLIAM ST., NEAR JOHN.

3-4 and 6-4 Damasks, Union and Worsted; Moreens, Rattinetts, Cloths, Silk and Cotton Velvets, English Buntings

S. W. Hill,

Mining Engineer and Surveyor, Eagle River, Lake Superior.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Starks & Pruyn,

MANUFACTURERS OF ALL KINDS OF

STEAM BOILERS,

52 and 54 Liberty, corner of Pruyn street

Nathan Starks, Wm. F. Pruyn, ALBANY. Special Partner R. H. Pruyn.

Iron Railing, Bank and Vault Doors, Iron Shutters Bridge and Roof Bolts, Heavy Jobbing and Forging of all kinds.

☞ For particularss ee Adv. in another column.

To Engineers and Surveyors.

E. BROWN AND SON Mathematical inst. makers No. 27 Fulton Slip, New York, make and keep for sale, Theodolites, Levelling inst., Levelling rods, Surveyors Compasses, and Chains, Cases of Mathematical drawing insts. various qualities, together with a general assortment of Ivory Scales and small insts. generally used by Engineers.

Samuel Kimber & Co., COMMISSION MERCHANTS

WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite Pig Iron, Hammered Railroad Car and Locomotive Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic Rams, etc., etc.

July, 27, 1849.

James Herron, *Civil Engineer*,

OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.,

PATENTEE OF THE

HERRON RAILWAY TRACK.

Models of this Track, on the most improved plans, may be seen at the Engineer's office of the New York and Erie Railroad.

To Railroad Companies.

—WROUGHT IRON WHEELS—
SAFETY AND ECONOMY.

NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,

Are Manufacturing Wrought Iron Driving, Truck, Tender, and Car Wheels—made from the best American Iron. Address E. S. NORRIS.

May 16, 1849.

Machinery Warehouse.

S. C. HILLS, No. 43 Fulton street, New York, has constantly for sale Steam Engines, Boilers, Lathes, Chucks, Drills, Planers, Force and Suction Pumps; Tenoning, Morticing and Boring Machines, Shingle Machines, Bolt and Nut Machines, Belting, Oil, Iron and Lead Pipe; Rubber, Percha and Leather Hose, &c., &c.

S. C. H.'s arrangements with several machine shops are such that he can supply, at very short notice, large quantities of machinery.

November 23, 1849.

Cruse & Burke,

Civil Engineers, Architects and Surveyors,
Office, New York State Institution of Civil Engineers,
STATE HALL, ALBANY., N. Y.

Drawings, specifications and surveys accurately executed. Pupils instructed theoretically and practically at a moderate premium.

May 26, 1849.

Eaton, Gilbert & Co.,

Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.

Hudson River Foundry, THOMAS & COLLINS,

130 Quay Street, Albany.

To Railroad & Navigation Cos.

MR. M. BUTT HEWSON, *Civil Engineer*, offers his services to Companies about to carry out the surveys or works of a line of Navigation or Railroad. He can give satisfactory references in New York City as to his professional qualifications; and will therefore merely refer here to the fact of his having been engaged for upwards of two years conducting important Public Works for the British Government.

Communications will find Mr. Hewson at the office of the Railroad Journal, 54 Wall Street, New York.

Walter R. Johnson,

CIVIL AND MINING ENGINEER AND ATTORNEY for Patents. Office and Laboratory, F St., opposite the Patent office, Washington, D. C.

Cop Waste.

CLEAN COP WASTE, suitable for cleaning Railroad, Steamboat and Stationary Engines, constantly an hand and for sale by

KENNEDY & GELSTON,
5½ Pine St., New York.

October 27, 1849, 3m

Ranstead, Dearborn & Co.,

MANUFACTURERS OF

LOCOMOTIVE CRANKS AND CAR AXLES,

ALSO

WROUGHT IRON SHAFTING,

And All Kinds of Hammered Shapes.

Forge at Commercial Point, Dorchester,
Office 25 Foster's Wharf, opposite No. 211 Broad St.

BOSTON.

IRON.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue Iron, Spring and Blistered Steel, Nail Rods, Best Refined Bar Iron, Railroad Iron, Car Axles, Nails, Stove Castings, Cast Iron Pipes of all sizes, Railway Chairs of approved patterns' for sale by

COLEMAN, KELTON & CAMBELL,
109 N. Water St., Philadelphia.

IRONDALE PIG METAL, MANUFACTURED and for sale by the Bloomsburg Railroad Iron Co.

DUDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.

500 Tons, afloat, weighing 57 pounds per lineal yard, for sale by

COLLINS, VOSE & CO.,
158 South St.

New York, November 17, 1849. 1m46

Railroad Iron.

1675 Tons, weighing about 61 lbs. per yard, 90 tons, weighing about 52 lbs. per yard, and 825 tons, weighing about 53½ lbs. per yard, of the latest and most approved patterns of T rail, for sale by

BOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Feb. 25, 1850.

N.B.—B., J. & Co are also prepared to take contracts for English rails, delivered in any of the Atlantic ports of the Unitad States.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrangements abroad, are prepared to contract for the delivery of Foreign rails, of approved brands upon the most favorable terms.

They will also make contracts for American rails, made at their Trenton works, from Andover Iron, in whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and Market Wire; Braziers and Wire Rods; Rivets and Merchant Bars to order, all made exclusively from Andover Iron. The attention of parties who require iron of the *very best* quality for special purposes, is respectfully invited.

COOPER & HEWITT,
17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.

Round Iron,	Band Iron,	Hoop Iron,
Square "	Flat "	Scroll "

Axles, Locomotive Tyres,

Manufactured at the Glendon Mills, East Boston, for sale by

GEORGE GARDNER & CO.,
5 Liberty Square, Boston, Mass.

Sept. 15, 1849. 3m37

PATENT HAMMERED RAILROAD, SHIP & BOAT SPIKES.—The Albany Iron Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes from 2 to 12 inches in length, and of any form of head. From the excellence of the material always used in their manufacture, and their very general use for rail roads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscribers at the works will be promptly executed.

JOHN F. WINSLOW, *Agent*.
Albany Iron and Nail Works, Troy, N. Y.

The above Spikes may be had at factory prices, of Erastus Corning & Co Albany; Merritt & Co., New York; E. Pratt & Brother, Baltimore, Md.

LAP—WELDED WROUGHT IRON TUBES

FOR

TUBULAR BOILERS,

FROM ONE AND A QUARTER TO SEVEN INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,
28 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO contract for the delivery of English Railroad Iron of favorite brands, during the Spring. They also receive orders for the importation of Pig, Bar, Sheet, etc. Iron.

THOMAS B. SANDS & CO.,
22 South William street,
February 3, 1849. New York.

Iron Store.

THE Subscribers, having the selling agency of the following named Rolling Mills, viz: Norristown, Rough and Ready, Kensington, Triadelphia, Pottsgrove and Thorndale, can supply Railroad Companies, Merchants and others, at the wholesale mill prices for bars of all sizes, sheets cut to order as large as 58 in. diameter; Railroad Iron, domestic and foreign; Locomotive tire welded to given size; Chairs and Spikes; Iron for shafting, locomotive and general machinery purposes; Cast, Shear, Blister and Spring Steel; Boiler rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,
Iron Merchants,
Schuylkill 7th and Market Sts., Philadelphia.

August 16, 1849. 1y33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, Alleghany county, Maryland, having recently passed into the hands of new proprietors, are now prepared, with increased facilities, to execute orders for any of the various patterns of Railroad Iron. Communications addressed to either of the subscribers will have prompt attention.

J. F. WINSLOW, *President*
Troy, N.Y.
ERASTUS CORNING, Albany
WARREN DELANO, Jr., N.Y.
JOHN M. FORBES, Boston.
ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO take orders for Railroad Iron to be made at their Phœnix Iron Works, situated on the Schuylkill River, near this city, and at their Safe Harbor Iron Works, situated in Lancaster County, on the Susquehannah river; which two establishments are now turning out upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly supplied with rails of any required pattern, and of the very best quality.

REEVES, BUCK & CO.,
45 North Water St., Philadelphia.

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR
IRON FOUNDRY AND MACHINE SHOP
In complete operation, are prepared to execute faithfully and promptly, orders for
Locomotive or Stationary Steam Engines,
Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills,
Slide, Hand or Chuck Lathes,
Machinery for cutting all kinds of Gearing.
Hydraulic, Tobacco and other Presses,
Car and Locomotive patent Ring Wheels, warranted,
Bridge and Mill Castings of every description,
Gas and Water Pipes of all sizes, warranted,
Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete

☞Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

☞ Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS, Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.

FOR SALE,

300	Tons	A 1,	Iron Dale	Foundry Iron.
100	"	1,	"	"
100	"	2,	"	"
100	"	"	Forge	"
400	"	Wilkesbarre	"	"
100	"	"Roaring Run"	Foundry	Iron.
300	"	Fort	"	"
50	"	Catoctin	"	"
250	"	Chikiswalungo	"	"
50	"	"Columbia" "chilling" iron, a very superior article for car wheels.		
75	"	"Columbia" refined boiler blooms.		
30	"	1 x ¼ Slit iron.		
50	"	Best Penna. boiler iron.		
50	"	"Puddled" "		
50	"	Bagnall & Sons refined bar iron.		
50	"	Common bar iron.		

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,
New York. 64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,

Offer for sale *Hot Blast* Charcoal *Pig Iron* made at the *Catoctin* (Maryland), and *Taylor* (Virginia), *Furnaces; Cold Blas.* Charcoal Pig Iron from the *Cloverdale* and *Catawba* Va., Furnaces, suitable for *Wheels* or *Machinery* requiring *extra* strength; also *Boiler* and *Flue Iron* from the mills of Edge & Hilles in Delaware, and *best quality Boiler Blooms* made from *Cold Blast Pig Iron* at th *Shenandoah Works*, Va. The productions of the above establishments can always be had at the lowest market prices for approved paper.

American Pig Iron of other brands, and *Rolled* and *Hammered Bar Iron* furnished at lowest prices. Agents for *Watson's Perth Amboy Fire Bricks*, and Rich & Cos. New York Salamande. Iron Chests.

Baltimore, June 14, 1849. 6 mos

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.

Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.

Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,
6m9 62 Buchanan's Wharf, Baltimore.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150	tons	No. 1 Boonton	Foundry Pig Iron.
100	"	No. 2 do.	do.
300	"	Nos. 2 & 3 Forge	do.
100	"	No. 2 Glendon	do.
140	"	Nos. 2 & 3 Lehigh Crane	do.
100	"	No. 1 Pompton Charcoal	do.
100	"	New-Jersey Blooms	
50	"	New-Jersey Faggoting Iron, for shafts	

Best Bars, ½ to 4 inch by ½ to 1 inch thick.
Do do Rounds and Squares, ½ to 3 inch.
Rounds and Squares, 3-16 to 1 inch.
Half Rounds, ½ to 1 in. Ovals & Half Ovals ½ to 1½ in.
Bands, 1½ to 4 inch. Hoops, ½ to 2 inch.
Trunk Hoops, ½ to 1½ in. Horse Shoe & Nut Iron.
Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,
PARK WORKS, SHEFFIELD,
Double Refined Cast Steel—square, flat and octagon.
Best warranted Cast Steel—square, flat and octagon.
Best double and single Shear Steel—warranted.
Machinery Steel—round.
Best and 2d gy. Sheet Steel—for saws and other purposes.
German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.
Genuine "Sykes," L Blister Steel.
Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by WM. JESSOP & SONS,
91 John street, New York.

Also by their Agents—
Curtus & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
May 6, 1848.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, setts immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by OGDEN & MARTIN, 104 Wall st.
February 16, 1850. 1y*

The above cement is used in most of the fortifications building by government.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND
ENGINEERING AND MACHINE FILES,

which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.
November 23 1849.

Railroad Iron.

1,500	Tons	weighing 58	lbs.	per lineal yard.
500	"	" 57	"	"
500	"	" 56	"	"
500	"	" 60 & 61	lbs,	"

Also 2½x½ flat rails. All the above being of approved patterns. For sale by

DAVIS, BROOKS, & CO.,
68 Broad street.

N.B.—Rails imported on commission, or at a fixed price.

CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rails) manufactured and for sale by FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,
Of a Favorite Brand,
And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by

CHARLES ILLIUS,
20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent for "*Baxter's Machine and Burning Oil*"—particularly adapted for "*Railroads*" and other Machinery—Preferred to Sperm by the many now using it, and 25 *per cent. cheaper.*

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract to deliver Rails of superior quality, and of any size or pattern, to any ports of discharge in the United States.

COLLINS, VOSE & CO.,
158 South St.
New York, November 17, 1849.

To Steam Engine Builders.

THE Undersigned offer for sale, *at less than half its cost*, the following *new machinery*, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz.

2 Wrought Iron Cranks, 60 inches from centre to centre.
1 Do. do. Connecting Rod Strap.
2 Do. do. Crank Pins.
1 Eccentric Strap.
1 Diagonal Link with Brasses.
1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,
No. 57 South Gay St., Baltimore, Md.
Sept. 12, 1849.

Ballard's Improved JACK-SCREW.

PATENTED.

THE ADVANTAGES OF THIS Screw for Stone Quarries, Railroads, Steam Boiler Builders, and for other purposes are superior to any other similar machine.

The improvement consists in being able to use either end of the screw, as occasion requires.

It is capable of raising the heaviest Locomotive with ease, being portable, strong and powerful, and not likely to get out of order.

Many Railroad Companies and Boiler Makers have them in use—by whom they are highly recommended.

JACK SCREWS,
of various sizes, power and price, constantly on hand at the manufactory.

No. 7 Eldridge Street,
near Division Street.
New York, Jan. 19, 1850.

To Railroad Companies and Contractors.

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address JAMES ROWLAND,
Prest. Beaver Meadow Railroad & Coal Co.,
Philadelphia.
or, L. CHAMBERLAIN, Sec'y,
at Beaver Meadow, Pa.
May 19, 1849. 20tf

SPRING STEEL FOR LOCOMOTIVES, TENDERS AND CARS.—The subscriber is engaged in manufacturing spring steel from 1¼ to 6 inches in width, and of any thickness required: large quantities are yearly furnished for railroad purposes, and wherever used its quality has been approved of. The establishment being large, can execute orders with great promptitude, at reasonable prices, and the quality warranted. Address J. F. WINSLOW, *Agent*,
Albany Iron and Nail Works.

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and *warranted to perform well.* Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price $1,500.

Address J. B. MOORHEAD,
Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia.

September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—*Bearing and Buffer—Fuller's Patent—Hose* from 1 to 12 inches diameter. Suction Hose. *Steam Packing*—from 1-16 to 2 in. thick. *Rubber and Gutta Percha Bands.* These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,
Warehouse 23 Courtlandt street.

New York, May 21, 1849.

Fire Brick.

THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,

from the best Welch quarries, and of all sizes. Also,

COAL,

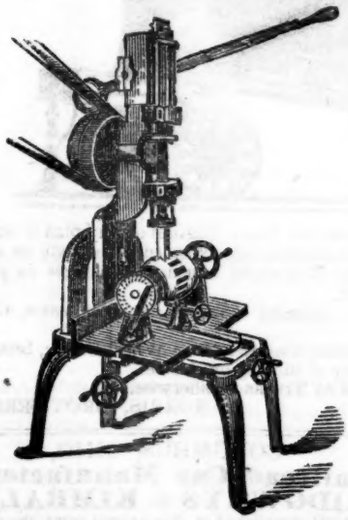
of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,
275 Pearl and 43 Gold Sts., New York.

November, 23, 1849.

Capt. Alfred Swingle's PATENT BORING & MORTISING MACHINE.



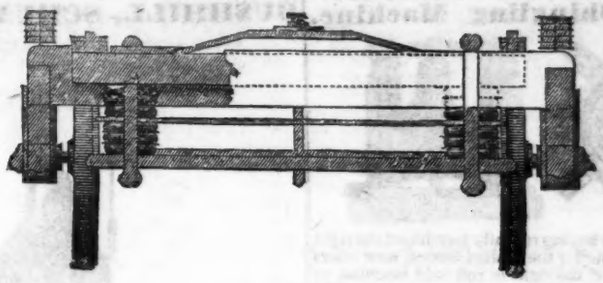
The above Machine was invented by A. SWINGLE, of Texas, in 1846, and Letters Patent were taken out in July, 1848. As a labor saving Machine it stands unrivalled even in these days of improvements. Its uses are innumerable; it may be successfully applied to Doors, Sashes, Carriages, Wheel-Hubs, and in fact to all kinds of work where the Auger and Chisel can be brought to bear.

The only limit to the speed of the working of this machine is the heating of the tools used. It will perform at least the labor of twelve men, and in vastly better manner, and can be worked equally well by steam power or by hand. It has been used and has given universal satisfaction.

For further information apply to H. B. TEBBETTS, 40 Wall St., New York, to whom all orders are to be addressed.

New York, December 15, 1849.

FULLER'S PATENT INDIA RUBBER CAR SPRINGS.



RAILROAD COMPANIES are cautioned, before purchasing Springs, to examine the actual patents and judge for themselves.

Persons, under the Title of the New England Car Company, seeking fraudulently to invade Fuller's rights have put forth so many statements for the purpose of misleading the public, that an enumeration of some facts is absolutely necessary, for the purpose of putting persons interested upon their guard.

Fuller's patent is for the application of Discs of India-rubber with Metal Plates, for forming Springs for Railway Cars and Carriages—either one disc and two plates, or ten discs and plates, or any other number, are equally covered by the patent. Fuller is not bound to the use of short discs—he may use long discs and plates.

Ray's patent is simply and wholly the forming of air tight rubber cylinders, with hoops or bands round the outside, and the combination of elasticity of India rubber, with the elasticity of atmospheric air confined in the cylinder, and in no part of his patent is he authorised to use the form of spring which he is now fraudulently supplying to Railroad Companies. Such springs are direct and positive infringements of the very letter of Fuller's patent.

Fuller's patent is dated October, 1845, Ray's patent, August, 1848.

The spring patented by Ray never has been put in operation, and never can be made useful for Railroad cars.

A mere experiment, even if made, it is well known does not prove an invention; and it is ridiculous for such parties to hope to mislead the Presidents and Superintendents of Railroad companies, by claiming the invention because Ray alledges he made an experiment—which Fuller had made before him—had actually brought into working order, and obtained a patent for—and this too before Mr. Ray states he made his experiment—and that experiment not claimed to have been applied to a car or carriage.

Besides, the invention could not have been developed until India rubber, properly Vulcanised, could be made of a sufficient thickness. In the United States the art of vulcanising rubber by steam heat, (by which means only can a body of rubber having any considerable thickness be vulcanised,) was not introduced until after the grant by the American government of the patent for springs to Fuller—whereas the process of vulcanising rubber by steam heat was invented in England about three years previously, and was used by Fuller there. This fact refutes entirely the claim of invention put forth by Mr. Ray, and proves the impossibility of his pretensions being true.

Fuller was the first and only inventor of the spring. A Mr. Dorr, whose connection with Mr. Goodyear is well known in this country, applied in England to Mr. Fuller, after he had published and patented his invention, and introduced another party for the purpose of obtaining the agency for the United States. They were furnished with a complete set of drawings and models, and with instructions to make arrangements for the supply of material of American manufacture—from that hour to the present not a single communication has been received from them. Some of these identical models have been traced into the hands of parties now seeking to invade Fuller's rights, and who have exhibited them as specimens of their own invention.

After this, the conveyance was made by Goodyear to certain parties here for the use for railroad springs of what he calls his Metallic rubber. Comment is unnecessary.

There are 5 or 6 different processes for the manufacture of vulcanised rubber, patented by as many different parties, some here, some in England, either of which would probably make good springs.

A large and powerful company has been organised under [illegible], the particulars of which shall be given [illegible].

An action has been commenced against three railroad companies for infringement; and all other parties will assuredly be prosecuted if they continue farther to infringe upon Fuller's patent.

W. C. FULLER,

The only persons authorised to supply the Springs are G. M. KNEVITT, 38 Broadway, N. York, General Agent for the U. S.: and JAS. LEE & Co., 18 India Wharf, Boston. JOHN THORNLEY, Chestnut st., Philad.

FAIRBANKS' RAILROAD SCALES.—THE subscribers are prepared to construct at short notice, *Railroad* and *Depot Scales*, of any desired length and capacity. Their long experience as manufacturers—their improvements in the construction of the various modifications, having reference to strength, durability, retention of adjustment, accuracy of weight and dispatch in weighing—and the long and severe tests to which their scales have been subjected—combine to ensure for these scales the universal confidence of the public.

No other scales are so extensively used upon railroads, either in the United States or Great Britain;—and the managers refer with confidence to the following in the United States.

Eastern Railroad.	Boston & Maine Railroad.
Providence Railroad.	Providence and Wor. Road.
Western Railroad.	Concord Railroad.
Old Colony Railroad.	Fitchburg Railroad.
Schenectady Railroad.	Syracuse and Utica Road.
Balt. and Ohio Railroad.	Baltimore and Susq. Road.
Phila. & Reading Road.	Schuylkill Valley Road.
Central (Ga.) Railroad.	Macon and Western Road.

New York and Erie Railroad.

And other principal Railroads in the Western, Middle and Southern States.

E. & F. FAIRBANKS & CO.
St. Johnsbury, Vt.

Agents, { FAIRBANKS & Co., 81 Water St., N. York. A. B. NORRIS, 196 Market St. Philadelphia.

April 22, 1849. 1y*17

Patent India Rubber Steam Packing.

THIS article, made by the subscriber, who alone is authorised to make it, is warranted to stand as high a degree of heat *as any that has been or can be made by any person*—and is the article which has made the reputation of India Rubber Steam Packing and the demand therefor. A large assortment of all thicknesses requisite for any description of engines, steam pipes, valves, etc., constantly on hand and for sale by the manufacturer and patentee, who will give every information regarding its properties, mode of use, etc. at the warehouse. JOHN GREACHEN, JR.,
98 Broadway, opposite Trinity Church.

New York, October, 1849.

Ibbotson, Brothers & Co's CELEBRATED CAST STEEL AND

Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

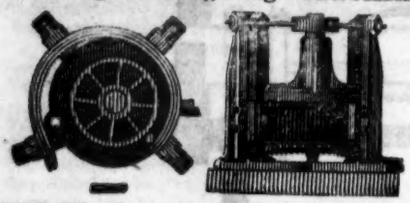
Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY J. IBBOTSON, Agent.,
218 Pearl st., New York.

February 25, 1850.

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phœnixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has give universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery *for making Spikes*, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, *Agent*,
Troy Iron and Nail Factory, Troy, N. Y.

RAILROAD WHEELS.

CHILLED RAILROAD WHEELS.—THE UNdersigned are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

CHILLED RAILROAD WHEELS.—THE UNdersigned, the *Original Inventor* of the *Plate Wheel* with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

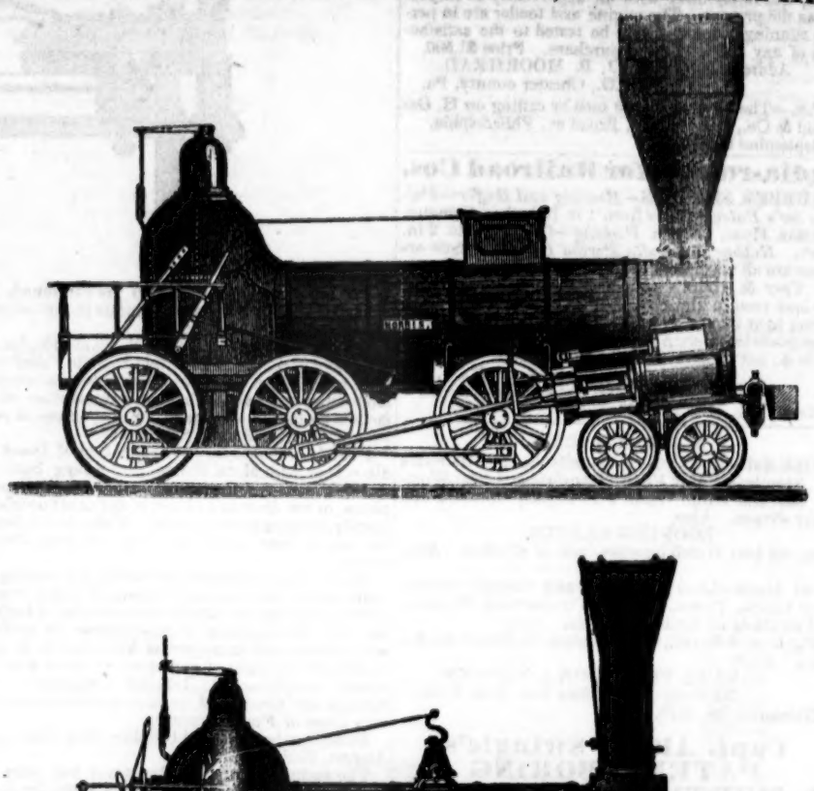
A. TIERS,
Point Pleasant Foundry.

He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country. A. T.

Kensington, Philadelphia Co.,
March 12, 1848.

NORRIS' LOCOMOTIVE WORKS.

BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,



THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size.

Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tires are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

LAWRENCE'S ROSENDALE HYDRAULIC Cement. This Cement is warranted equal to any manufactured in this country, and has been pronounced superior to Francis' "Roman." Its value for Aqueducts, Locks, Bridges, Flooms, and all Masonry exposed to dampness, is well known, as it sets immediately under water, and increases in solidity for years.

For sale in lots to suit purchasers, in tight papered barrels, by JOHN W. LAWRENCE,
142 Front-street, New York.

☞ Orders for the above will be received and promptly attended to at this office. 32 1y.

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, *Agent*,
Troy Iron and Nail Factory, Troy, N. Y.

COLUMBUS, OHIO,

Railroad Car Manufactory.

RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited. 1y8

To Inventors and Patentees.

OWEN G WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs. 1y3

MR. HALE:—"The New England Car Co., having been engaged for the last six months in introducing the Vulcanized India-rubber Car Spaings upon the different railroads in this and other states, and having in particular introduced it upon the Boston and Worcester railroad with perfect success, were much gratified to find, by your paper of this morning, that the article had given satisfaction to the president of that corporation, and the terms of just commendation in which you were pleased to speak of it. But their gratification was scarcely equalled by their surprise, when, or arriving at the close of your paragraph, they found the results of all their labors attributed to a foreign source, with which the New England Car Co. has no connection. The material used on the Boston and Worcester railroad, and all the other railroads in this country, where any preparation of India-rubber has been successfully applied, is entirely an American invention, patented in the year 1844 to Charles Goodyear, of New Haven, Conn., and the application of it to this purpose and the form in which it is applied are the invention of F. M. Ray of New York. The only material now in use, and so far as has yet appeared, the only preparation of India rubber capable of answering the purpose, has been furnished under these patents by the New England Car Company, manufactured under the immediate inspection of their own agent. If any other should be produced, the right to use it would depend upon the question of its interference with Mr. Goodyear's patent. The New England Car Company have their place of business in this city at No. 99 State street, and are prepared to answer all orders for the Vulcanised India rubber Car Springs, of the same quality and of the same manufacture as those which they have already placed on your road, and most fo the other roads terminating in this city."

And yet Mr. Knevitt is using these experiments made upon the Springs of the Car Company to induce the public to purchase his springs, and is attempting to impose upon them the belief that the springs used were furnished by him! We ask whether such a course is honorable, or entitles his statements to much consideration from the public.

The above Springs are for sale 98 Broadway, New York, and 99 State street, Boston.

EDWARD CRANE Agent, Boston.
F. M. RAY, Agent, New York.

Boston, May 8, 1849.

NICOLL'S PATENT SAFETY SWITCH FOR Railroad Turnouts. This invention for some time in successful operation on one of the principal railroads in the country, effectually prevents engines and their trains from running off the track at a switch, left wrong by accident or design. It acts independently of the main track rails; being laid down or removed without cutting or displacing them.

It is never touched by passing trains, except when in use, preventing their running off the track. It is simple in its construction and operation, requiring only two castings and two rails; the latter, even if much worn or used, not objectionable.

Working models of the Safety Switch may be seen at Messrs. Davenport, Bridges & Kirk's Cambridge Port, Mass., and at the office of the Railroad Journal, New York.

Plans, Specifications, and all information obtained, on application to the Subscriber, Inventor and Patentee.

G. A. NICOLLS,
Reading, Pa.

Railroad Lanterns.

COPPER and Iron Lanterns for Railroad Engines, fitted with heavy silver plated Parabolic Reflectors of the most approved construction, and Solar Argand Lamps; manufactured by

HENRY N. HOOPER & CO.,
No. 24 Commercial St. Boston.

August, 16, 1849. 6m33

NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, N. Y.

THESE Works are in full operation in Manufacturing to order, Locomotive Steam Engines & Tenders, of the best principle and construction of material, using wrought iron heavy frames with pedestals welded thereto, and all parts of the engine made of the best wrought iron, except cylinders, pumps and boxes—obtaining greater durability, and carrying less weight over the road, than engines constructed of cast iron.

Wrought Iron Tires made any required size, and Tire Bars bent and welded with dispatch.

Chilled Wheels for Cars, Tucks and Tenders, made from the toughest iron.

Driving and Tender and Car Wheels fitted to Axles with Brass Boxes and Springs, and Railroad Machinery generally. Manufactured and for sale by

E. S. NORRIS.

April 11, 1849.

Hydraulic Cement.

KINGSTON LIME AND CEMENT CO.
OFFICE
271 PEARL-ST.
N. Y.

HYDRAULIC CEMENT, OF BEST QUALITY, manufactured at their works, for sale in lots to suit purchasers.

Also, Ground Lime, a superior article for Builders.

ISAAC FRYER, Sec'y.

January 19, 1850. 1y

Engine and Car Works,
PORTLAND, MAINE.

THE PORTLAND COMPANY, Incorporated August 8th, 1846, with a capital of $250,000, have erected their extensive Works upon the deep water of Portland Harbor, and receive and transport, to and from their works direct, to and from vessels of any class.

They now manufacture to order, and deliver upon the Railroads running in each direction from the city, or on shipboard as wanted, Locomotive, Stationary, or Steam Boat Engines; Passenger, Mail, Freight, Earth and Hand Cars; Railway Frogs, Switches, Chairs and Castings; and every other description of Machinery.

HORACE FELTON,
Superintendent.

JAMES C. CHURCHILL,
General Agent and Clerk.

RAILROADS.

EASTERN RAILROAD.

WINTER ARRANGEMENT.

On and after Monday, October 8, 1849, trains leave Boston daily (Sundays excepted);

For Lynn, 7, 8½, 10 a.m., 12½, 2½, 4, 4½, 6½, p.m.
Salem, 7, 8½ 10, a.m., 12½, 2½, 4, 4½, 6½, p.m.
Manchester and Gloucester, 10 a.m., 4 p.m.
Newburyport, 7, a.m., 12½, 2½ 4½, p.m.
Portsmouth, 7, am., 2½, 4½, pm.
Portland, Me., 7, am., 2½, pm.

And for Boston,

From Portland, 8½ am., 4 pm.
Portsmouth, 7, 10½*, am., 6½*, pm.
Newburyport, 7½, 11½*, am., 3½ 7*, pm.
Gloucester, 7½, am., 1½pm.
Manchester, 8 am., 2 pm.,
Lynn, 7½, 8½*, 9½*, 10½ am., 12 55*, 2½* 4½* 8½* pm.
Salem, 7½, 8½*, 9*, 10½ am., 12 40*, 2½* 4½,* 8*, pm.

**Or on their arrival from the East.*

Freight trains each way daily. Office 17 Merchants' Row, Boston.

Feb. 3. JOHN KINSMAN, Superintendent.

ALBANY AND BUFFALO RAILROADS.—Four Trains daily, Sundays excepted, viz:
Leave Albany, 6 a.m., 9 a.m., 2 p.m., 7 p.m.
Reach Buffalo, 15 hours, 18 hours, 23 hours, 18 hours.
Arrive from Buffalo, 7 p.m., 2½ a.m., 12½ m., 3½ p.m.

Passengers by the *Express Train* reach Buffalo from New York, and New York from Buffalo, in 24 hours. The Isaac Newton and Oregon connect at Albany with this Train. Baggage cars, with careful baggage masters, run through with all the trains.

For Schenectady, Saratoga Springs & Whitehall,

Leave Albany at 7 a.m. and 2 p.m. For Schenectady only at 6, 7 and 9 a.m. and 12½, 2 and 7 p.m. For Erie Canal packets at 7 a.m. and 7 p.m. By Plank Road from Schenectady to Saratoga at all hours by stages, etc.

The *Eastern Trains* leave Albany at 7 a.m. and 3 p.m. The wagons of the company take baggage *free* between railroads and steamboats at Albany.

E. FOSTER, Jr., Sec'y
Albany and Schenectady Railroad Co.

Albany, August, 1849.

BOSTON AND MAINE RAILROAD.

Winter Arrangement, 1850.
Outward Trains from Boston

For Portland at 7 am. and 2½ pm.
For Rochester at 7 am., 2½ pm.
For Great Falls at 7 am., 2½, 3½ pm.
For Haverhill at 7 and 9½ am., 2½, 3½, 5½, pm.
For Lawrence 7, 7½, 9½ am., 12m. 2½, 3½, 4½ 5½, pm.
For Reading 7, 9½ am., 12m. 2½, 3½, 4½, 5½, 7½, 9½ pm.
For Medford 7½, 9½ a.m., 12½, 2½, 5, 6½, 9½ p.m.
The Station in Boston is on Haymarket Square.

CHAS. MINOT, Sup't.

January 10, 1850.

NEW YORK AND HARLEM RAILROAD.
NEW ARRANGEMENT.

On and after Wednesday, October 17th, 1849, the Cars will run as follows, (Sundays excepted) until further notice:

Trains will leave the City Hall, New York, for—
Harlem and Morrisania at 6½, 8, 10, 11, 12 am., 2, 3½, 4, 5, 6½ pm.
New Village, at 8½, 10, 12 am., 3½, 5, 6½ pm.
Fordham and Williams' Bridge, at 8½, 10, 12 am., 2½ 3½, 5, 6½ pm.
Hunt's Bridge, Underhill's and Hart's Corners, at 8½, 10 am., 3½, 5 pm.
Tuckahoe and White Plains, at 8½, 10 am., 2½, 3½, 5 pm.
Pleasantville, New Castle, Bedford, Mechanicsville, Purdy's, Croton Falls, and intermediate stations, on signal, 8½ am., 2½, 3½ pm.
Brewster's, Towner's, Patterson, Pauiding's, South Dover, Dover Furnace, and Dover Plains, 8½ am., 2½ pm.

NOTICE—Passengers are reminded of the great danger of standing upon the platform of the cars, and hereby notified that the practice is contrary to the rules of the Company, and that they do not admit any responsibility for injury sustained by any passenger upon the platforms, in case of accident.

Returning to New York will leave
Harlem and Morrisiana at 6 08, 7½, 8 37, 9, 10 6, 12 am., 1 43, 3 07, 3½, 5, 5 47 pm.
New Village, at 5 58, 8 27, 9 56 am., 1 33, 2 57, 5 36 pm.
Fordham and William's Bridge at 5½, 8 14, 9 43, 10 57 am., 1 20, 2 44, 5 24 pm.
Hunt's Bridge at 8 04, 9 33 am., 2 34, 5 16 pm. On signal.
Underhill's, at 7 56, 9 23 a.m., 2 26, 5 10 p.m. On signal.
Tuckahoe at 7 53, 9 18, 10 40 am., 2 23, 5 08 pm.
Hart's Corners at 7 38, 9 03 am., 2 08, 4 54 pm.—On signal.
White Plains at 7½, 8 55, 10 20 am., 2, 4 47 pm.
Davis' Brook at 8 40, 10 11 am., On signal. 4 39 pm. On signal.
Unionville, 8 27, 10 11 am. On signal. 4 29 pm.—On signal.
Pleasantville at 8 20, 9 56 am., 4 24 pm.
Champaqua, at 8 10, 9 50 am. On signal. 4 18 pm. On signal.
New Castle, at 7 56, 9 38 am.. 4 07 pm.
Bedford at 7 46, 9 32 am., 4 02 pm.
Mechanicsville at 7 36, 9 22 am., 3 52 pm.
Golden's Bridge, 7 28, 9 17 am. On signal, 3 47 p m. On signal.
Purdy's at 7 20, 9 09 am., 3 39 pm.
Croton Falls, at 7½, 9 04 am.,3 34 pm.
Brewster's, at 8 50 am., 3 20 pm.
Towner's, at 8 35 am., 3 05 pm.
Paterson, at 8 27 am., 2 57 pm.
Pauiding's, at 8 17 am., 2 47 pm.
South Dover, 8 02 am., 2 32 pm.
Dover Furnace, 7 55 am., 2 25 pm.
Dover Plains, at 7 45 am., 2 15 pm.

The trains for Harlem and Morrisiana leaving City Hall at 6½, 8, 10, 11, 12, 2, 4 and 6½, returning from Morrisiana and Harlem at 6 08, 7½, 9, 12, 1 43, 3 07, 3½ and 5 o'clock, will land and receive passengers at 27th 42d, 51st, 61st, 79th, 86th, 109th, 115th, 125th and 132d streets.

The Dover Plains train from New York at 2½ pm., returning leaving Dover Plains at 7½ am., will not stop between White Plains and New York, (except at Tuckahoe, Williams' Bridge and Fordham,) unless to leave passengers coming from above Croton Falls.

A car will precede each train ten minutes to take up passengers in the city. The last car will not stop, except at Broome st. and 27th street.

Freight Trains leave New York at 1 o'clock pm.—Returning, leaves Dover Plains at 12 o'clock m.

For Sunday Aarrangements, see hand bills.

M. SLOAT, Sup't.

NEW YORK AND ERIE RAILROAD. OPEN TO ELMIRA.

On and after the 8th of October, the trains will run as follows, (Sundays excepted):

THROUGH PASSENGER TRAINS from New York to Elmira, will leave the Company's Pier at the foot of Duane street, at 7 o'clock a.m. and 5 o'clock p.m. stopping at all the way stations.

From Elmira the through trains will leave for New York at 5 o'clock a.m. and 6½ p. m., stopping also at all the way stations.

A SPECIAL WAY TRAIN, for Port Jervis and intermediate stations, except Sufferns, will leave New York every Saturday at 3 p. m., and will leave Port Jervis for New York every Monday morning, at 4 55 o'clock.

A MILK TRAIN, with Passenger Cars attached, will leave Port Jervis for New York at 3 o'clock a.m. and returning will leave New York for Port Jervis at 3 p.m. Another milk train with passenger car, will leave Piermont for Otisville at 9 am., and returning leave Otisville at 4 55 p.m., connecting with the freight boats to New York. The milk trains do not connect with the P. and R. railroad.

FREIGHT.—Freight leaves New York every night for all the regular stations on the road. A freight train will leave Elmira every morning at 3 20 o'clock a.m. —A freight train will leave Port Jervis for New York every morning at 5 o'clock, and another at 8 a.m. with market freights.

A Special Train for cattle and other live stock, will leave Elmira on Tuesdays and Fridays at 12 20 p.m.; and from Port Jervis, for New York, on Wednesdays and Saturdays, at 8 40 a.m.

FARE from New York to Elmira $5 75. The intermediate stations in proportion.

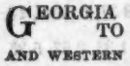
COMMUTATION TICKETS, at lower rates, for the stations between New York and Port Jervis, can be purchased at the New York and Piermont offices.

The Steamboat ERIE leaves New York for Piermont every day at 3 o'clock, and returns on the arrival of the train from Elmira, arriving at New York at about 7½ p.m.

JAMES P. KIRKWOOD, Superintendant.

GEORGIA RAILROAD. FROM AUGUSTA TO ATLANTA—171 MILES.

AND WESTERN AND ATLANTIC RAILROAD, FROM ATLANTA TO DALTON, 100 MILES.



This Road, in connection with the South Carolina Railroad, and Western and Atlantic Railroad, now forms a continuous line, 408 miles in length, from Charleston to Dalton Cross Plains) in Murray county, Ga. 32 miles from Chattanooga, Tenn.

RATES OF FREIGHT.

		Between Augusta and Dalton.	Between Charleston, and Dalton.
		271 miles.	408 miles.
1st class	Boxes of Hats, Bonnets, and Furniture, per cubic foot	$0 18	$0 28
2d class	Boxes and Bales of Dry Goods, Saddlery, Glass, Paints, Drugs, and Confectionary, per 100 lbs.	1 00	1 50
3d class	Sugar, Coffee, Liquor, Bagging, Rope, Cotton, Yarns Tobacco, Leather, Hides, Copper, Tin, Feathers, Sheet Iron, Hollow ware, Castings, Crockery, etc.	0 60	0 85
4th class	Flour Rice, Bacon, Pork, Beef, Fish, Lard, Tallow, Beeswax, Bar Iron, Ginseng, Mill Gearing, Pig Iron, and Grindstones, etc.	0 40	0 65
	Cotton, per 100 lbs.	0 45	0 70
	Molasses per hogshead	8 50	13 50
	" " barrel	2 50	4 25
	Salt per bushel	0 18	
	Salt per Liverpool sack	0 65	
	Ploughs, Corn Shellers, Cultivators, Straw Cutters, Wheelbarrows	0 75	1 50

German or other emigrants, in lots of 20 or more, will be carried over the above roads at 2 cents per mile.

Goods consigned to S. C. Railroad Company will be forwarded free of commissions. Freights payable at Dalton.

F. C. ARMS,
44°1y Sup't of Transportation.

LITTLE MIAMI RAILROAD.—SUMMER ARRANGEMENT.

CINCINNATI & SANDUSKY.

FIRST Passenger Train leaves Depot on East Front street, at 5 o'clock 10 minutes A. M. stops for breakfast at Morrow, and arrives at Springfield at 11 10 A. M. Leaves Springfield for Sandusky at 11 50 A. M.

Second Passenger Train leaves Depot 3 P. M. arrives at Springfield at 9 P.M. Passengers take tea at Springfield, and leaves for Sandusky at 9¼ P. M.

RETURNING—First Train leaves Springfield at 4 A. M. Stop for breakfast at Xenia, and arrives at Cincinnati at 10 15 A. M.

Second Train leaves Springfield at 2¼ P. M. Stop for tea at Morrow, and arrives at cincinnati, at 8¼ P. M.

Passengers taking the Morning Train arrive at Sandusky at 9 P. M. Those taking the Afternoon Train arrive at 7¼ A. M. next morning, and proceed directly on in the boats.

Passengers for columbus, Zanesville, Wheeling, and intermediate towns, should take the 5, 10 A. M., Train.

The Ohi Stage Company are running the following Lines in connection with the Trains:

A Daily Daylight Line to Columbus from Springfield in connection with the Morning Train from Cincinnati. Also, Daily Lines to Columbus, from Xenia and Springfield, connecting with the 3 o'clock, pm. Train from Cincinnati.

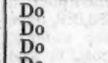
Fare from Cincinnati to	Xenia	- -	$1 90
Do	do	Springfield - -	2 50
Do	do	Sandusky City -	6 50
Do	do	Buffalo - -	10 00
Do	do	Columbus - -	4 50

For other information and through tickets, apply at the Ticket Office on Broadway, near Front-st., Cincinnati.

W. H. CLEMENT, Superintendent.

☞ The Company will not be responsible for Baggage exceeding 50 dollars in value, unless the same is returned to the Conductors or Agent, and freight paid at the rate of a passage for every 500 dollars in value above that amount.

PHILADELPHIA, WILMINGTON, & BALTIMORE RAILROAD.



Summer Arrangement.
April 1st, 1849.—Fare $3.

Leave Philadelphia 8½ am., and 10 pm.
Leave Baltimore 9 am, and 8 pm.
Sunday—Leave Philadelphia at 10 pm.
" " Baltimore at 8 pm.

Trains stop at way stations.

Charleston, S. C.

Through tickets Philadelphia to Charleston, $20.

Pittsburg and Wheeling.

Through ticket, Philadelphia to Pittsburg, $12.
" " Wheeling, 13.

Through tickets sold at Philadelphia office only.

Wilmington Accommodation.

Leave Philadelphia at 12 m. 4 and 7 pm.
Leave Wilmington at 7¼ am., 4½ and 7 pm.

Newcastle Line.

Leave Philadelphia at 2¼ pm.—Baltimore at 1½ pm
Fare $3.—Second class, $2.

N.B.—Extra baggage charged for.

I. R TRIMBLE, Gen. Supt.

BALTIMORE AND SUSQUEHANNA RAILROAD.—Reduction of Fare.

Morning and Afternoon Trains between Baltimore and York.—The Passenger Trains run daily, except Sundays, as follows:

Leave Baltimore at - - -	9 am. and 3½ pm.
Arrive at - - - - -	9 am. and 6½ pm.
Leave York at - - - -	5 am. and 3 pm.
Arrive at - - - - -	12½ pm. & 8 pm.
Leave York for Columbia at	1½ pm. & 8 am.
Leave Columbia for York at	8 am. & 2 pm.

Fare:

Fare to York - - - - -	$1 50
" Wrightsville - - - -	2 00
" Columbia - - - - -	2 12½

Way points in proportion.

PITTSBURG, GETTYSBURG, AND HARRISBURG.

Through tickets to Pittsburg via stage to Harrisburg - - - - - - -	$9
Or via Lancaster by railroad - - -	10
Through tickets to Harrisburg or Gettysburg -	3

In connection with the afternoon train at 3⅜ o'clock, a horse car is run to Green Spring and Owing's Mill, arriving at the Mills at - - - 5½ pm.
Returning, leaves Owing's Mills at - - - 7 am.

D. C. H. BORDLEY, Sup't.
31 1y Ticket Office, 63 North st.

PHILADELPHIA & READING RAILROAD. Passenger Train Arrangement for 1848.

A Passenger Train will leave Philadelphia and Pottsville daily, except Sundays, at 9 o'clock am.

The Train from Philadelphia arrives at Reading at 12 18 m.

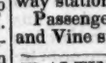
The Train from Pottsville arrives at Reading at 10 43 am.

	Fares.	Miles.	No. 1.	No. 2
Between Phila. and	Pottsville,	92	$3.50 and	$3.00
" "	Reading	58	2.25 and	1.90
" Pottsville	"	34	1.40 and	1.20

Five minutes allowed at Reading, and three at other way stations.

Passenger Depot in Philadelphia corner of Broad and Vine streets. 8tf.

BALTIMORE AND OHIO RAILROAD AND WASHINGTON BRANCH.



On and after January 1, 1850, Passenger Trains will run as follows:

Leave Baltimore for Ellicott's Mills, Frederick, Harper's Ferry, Martinsburg, Hancock and Cumberland, every morning at 7½ o'clock. This line carries the Great Mail, and connects with Post Coaches at Cumberland, for Wheeling and Pittsburg, over the National Road. Also with the Winchester Trains, at Harper's Ferry. N.B.—Passengers for Pittsburg take the steamers of the Monongahela slack water navigation at *Brownsville*, only 76 miles from Cumberland.

Leave Baltimore for Ellicott's Mills, Frederick and Harper's Ferry, daily, except Sunday, at 4½ p.m.

Leave Baltimore for Washington City, daily, at 6 a.m. and 5 p.m.—daily, except Sunday, at 9 a.m. The early train connects with the Great Southern Line, via Fredericksburg and Richmond, to Charleston.

Leave Cumberland for Baltimore, etc., at 8½ a. m., daily, connecting with the train from Winchester at Harper's Ferry—with the Evening Train to Washington City, at the Relay House—and with the Evening Train to Philadelphia, at Baltimore. Time for arriving at Baltimore, 5½ p.m.

Leave Harper's Ferry for Baltimore, daily, except Sunday, at 7½ a. m—taking in Passengers who leave Frederick at 8½ a.m.

Leave Washington for Baltimore, daily, at 6 a.m. & 5½ p.m., and *daily, except Sunday*, at 9½ a. m. The early train connects at the Relay House with the morning line to Cumberland and the West, and at Baltimore with the day line to Philadelphia and New York.

Through tickets are sold at *Philadelphia and Baltimore* for Pittsburgh and Wheeling, and at *Philadelphia and New York* for Charleston, S. C., at the following

RATES OF FARE.

	To Pittsburg. In winter.	Summer.	Wheeling. Win.	Sum.	Charleston.
From Philadelphia,	$13	$12	$14	$13	$20
" Baltimore,	11	10	12	11	
" New York,	.	.	.	.	20

Passengers leaving New York not later than the afternoon line via Newark, etc., reach Baltimore in season to take the next morning's lines to the South and West.

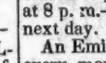
Passengers leaving Cumberland in the morning and Washington in the evening lines, reach Baltimore in season to proceed to Philadelphia by the evening train at 8 p. m.—so as to reach New York before noon the next day.

An Emigrant line by burthen cars, leaves Baltimore every morning, except Sundays, at 4 o'clock—connecting with a line of the previous day from N. York, —and at Cumberland with a wagon line to Pittsburg or Brownsville and Wheeling. Fare by this line:

From New York to Pittsburg,	$8 00
" Philadelphia "	6 50
" Baltimore "	5 00

By order, J. T. ENGLAND, Agent.

SOUTH CAROLINA RAILROAD.—A PASSENGER Train runs daily from Charleston, on the arrival of the boats from Wilmington, N. C., in connection with trains on the Georgia, and Western and Atlantic Railroads—and by stage lines and steamers connects with the Montgomery and West Point, and the Tuscumbia Railroad in N. Alabama.



Fare through from Charleston to Montgomery daily - - - - - -	$26 50
Fare through from Charleston to Huntsville, Decatur and Tuscumbia - - -	22 00

The South Carolina Railroad Co. engage to receive merchandize consigned to their order, and to forward the same to any point on their road; and to the different stations on the Georgia and Western and Atlantic Railroad; and to Montgomery, Ala., by the West Point and Montgomery Railroad.

JOHN KING, Jr., Agent.

LAKE SUPERIOR LINE.
Cleveland and Detroit,
TO
SAULT STE. MARIE, CARP RIVER, COPPER HARBOR, EAGLE RIVER, ISLE ROYAL, ONTONAGON AND LA POINT.

The Proprietors of this line having added largely to their facilities for transportation on this route, will be prepared to ship Goods to any part of Lake Superior during the coming season, and contract for the delivery of Copper Ore to either Boston, New York, or Pittsburg, being connected with the Troy and Western Line, from Detroit to New York, and a Daily line of Canal Boats

FROM CLEVELAND TO PITTSBURG.

Lakes Huron and Erie.

For this portion of the route, the Proprietors are fitting up a large Boat, with a powerful low pressure engine, and a spacious upper cabin, with state rooms, to take the place of the Franklin, which will leave CLEVELAND every *Monday Evening* at 7 o'clock, and DETROIT every *Tuesday Afternoon* at 2 o'clock, going to MACKINAW and the BRUCE MINES, and arriving at SAULT STE. MARIE on Thursday morning. The Franklin will leave Detroit every Friday for Mackinaw and Sault Ste. Marie, via the Bruce Mines. For the transportation of heavy masses of *Copper*, a Propeller will make trips as occasion may require.

Lake Superior.

Mr. McKnight, one of the Proprietors, is constructing a Wharf to the Channel Bank, at the head of the Portage, which will enable them to load their Propellers, NAPOLEON AND INDEPENDENCE, with but 24 hours' detention at Sault Ste. Marie. One of the Propellers will leave every *Friday*, making a trip through the Lake, touching at Carp River, Ontonagon and Isle Royal.

The great expense incurred in building wharves to facilitate business, it is hoped, will entitle the Proprietors of this Line to Patronage. Goods shipped by either G. WILLIAMS & CO., or S. P. BRADY, Agents, Detroit, will be receipted through to their destination on Lake Superior. Letters addressed to S. McKNIGHT, Detroit, or Sault Ste. Marie, will receive attention. Supplies will be purchased and delivered at any point on Lake Superior, on the best possible terms, and all orders filled with articles of as good quality as the market affords.

Canada Line.

To facilitate the forwarding of Goods for the Canada Companies, a connection has been made with PARK & CO., managing owners of the Propeller *Earl Cathcart*, forming a direct line from Montreal to the Bruce Mines and Sault Ste. Marie. Goods sent by this line, care of PARK & CO., Amherstburg, or CHAS. HUNT, Esq., Windsor, will be immediately forwarded, and at prices decidedly to the advantage of parties in Toronto or other Canadian Ports.

S. M'KNIGHT,
J. R. LIVINGSTON,
P. B. BARBEAU.

January, 1850.

AGENTS.

G. Williams & Co., } Detroit.
S. P. Brady, }
P. L. Sternberg & Co., Buffalo.
Charles Hunt, Windsor.
Park & Co., Amherstburg.
W. A. Otis & Co., }
Crawford and Chamberlain, } Cleveland.
Rice, Clapp & CO., New York.
W. M. Gorrie, Toronto.

MACHINE WORKS OF ROGERS KETCHUM & GROSVENOR, *Patterson, N. J.* The undersigned receive orders for the following articles manufactured by them of the most superior description in every particular. Their works being extensive, and the number of hands employed being large, they are enabled to execute both large and small orders with promptness and dispatch.

Railroad Work.—Locomotive Steam Engines and Tenders; Driving and other Locomotive Wheels, Axles Springs and Flange Tires; Car Wheels of Cast Iron a variety of patterns and chills; Car Wheels of Cast Iron with wrought tires; Axles of best American refined iron; springs; boxes and bolts for cars.

Cotton, Wool and Flax Machinery of all descriptions and of the most improved patterns, style and workmanship.

[illegible] gearing and millwright work generally, hydraulic [illegible] presses; press screws; callenders; lathes [illegible] ds; iron and brass castings of all

[illegible] M & GROSVENOR,
[illegible] roadway, New York.

CENTRAL RAILROAD FROM SAVANNAH TO MACON, (Ga.) 190¼ miles.

Passenger Trains leave Savannah and Macon daily at 7 a.m.
Passenger trains arrive daily at Savannah, 6 15 p.m.
" " " " Macon, 6 45 p.m.

This road, in connection with the Macon and Western road from Macon to Atlanta, and the Western and Atlantic road from Atlanta to Dalton, now forms a continuous line of 391¼ miles in length* from Savannah to Dalton, Murray county, Ga. and with the Memphis Branch railroad, and Stages connect with the following places:

Tickets from Savannah to		Macon,	$5 75
" " "		Atlanta,	9 50
" " "		Augusta,	6 50
" " "		Columbus,	15 00
" " "		Opelika,†	17 00
" " "		Jacksonville, Ala.,	20 00
" " "		Talladega, }	
" " "		Huntsville } Ala.,	22 00
" " "		Decatur, }	
" " "		Tuscumbia, Ala.,	22 50
" " "		Tuscaloosa, Ala., }	
" " "		Columbus, Miss, }	28 00
" " "		Aberdeen, " }	
" " "		Holly Springs	
" " "		Nashville, Tenn. }	
" " "		Murphreesboro' }	25 00
" " "		Columbia, do., }	
" " "		Memphis, do.,	30 00

An extra Passenger Train leaves Savannah on Saturdays, after the arrival of the Steam-ships from New York, for Macon, and connects with the Macon and Western railroad; and on Tuesdays, after the arrival of the Macon and Western cars, an extra Passenger Train leaves Macon to connect with the Steam ships for New York.

Stages for Tallahasse and intermediate places connect with the road at Macon, Mondays, Wednesdays, and Fridays, and with Milledgeville at Gordon daily.

Passengers for Montgomery, Mobile and New Orleans take stage for Opelika from Barnesville through Columbus a distance of 97 miles, or from Griffin thro' West Point, a distance ot 93 miles.

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* The Western and Atlantic railroad will soon be completed between Dalton and Chattanooga, a distance of 423¼ miles from Savannah, of which due notice will be given.

† Head of the West Point and Montgomery railroad, on which the fare to Montgomery is about $2.

RATES OF FREIGHT FOR MERCHANDIZE GENERALLY, FROM SAVANNAH TO MACON.

Measurement Goods.—Boxes of hats, bonnets, furniture, shoes, saddlery, dry-goods, and other measurement goods, per cubic foot - - 13 cents.
Crockery Ware, in crates, boxes or hhds, per cubic foot. - - - - 10 "
Goods by Weight, 1st class.—Boxes of glass, paints, drugs & confectionary, per 100 lbs., 50 "
2d class—Sugar, coffee, rope, butter, cheese, lard, tobacco, leather, hides, copper, sheet and hoop iron, tin, hard and hollow ware, rice, boxes soap and candles, bagging, and other heavy articles not enumerated below, per 100 lbs., - - - - 45 "
3d class—Flour, bacon, liquors, pork, beef, fish, tallow and beeswax, per 100 lbs., 40 "
4th class—Mill-gearing, pig and bar iron, grind and millstones, nails, spikes and coal, 100 lb. 30 "
Barrels of beets, bread, crackers, potatoes, ice, fruit, oysters, onions, and all light bbls, each, 75 "
Oil and molasses per hhd., (smaller casks in proportion) - - - $6 00 "
Salt per sack not exceeding 4 bushels, - 50 "

☞ Goods consigned to Thos. S. Wayne, Forwarding Agent, Savannah, will be forwarded free of commission. WM. M. WADLEY, Supt.

Savannah, Ga., February 24, 1850.

ENGINEERS' AND SURVEYERS'
INSTRUMENTS MADE BY
EDMUND DRAPER,
Surviving partner of
STANCLIFFE & DRAPER.

No 23 Pear street, near Third, below Walnut, Philadelphia.

GREAT NORTHERN & SOUTHERN MAIL ROUTE. From New York to Charleston, S. C.

daily, via *Philadelphia, Baltimore, Washington City, Richmond, Petersburg, Weldon and Wilmington, N. C.*

Travellers by this route, leaving New York at 4½ p. m., Philadelphia at 10 p.m., and Baltimore at 6 a.m., proceed without delay at any point on the route, arriving at Richmond, Va., in a day, and at Charleston, S. C., in two and half days from New York.

Through tickets from New York to Charleston, $20 00
" " Baltimore to Richmond, 7 00
" " " " Petersburg, 7 50

For tickets to Richmond and Petersburg, or further information, apply at the *Southern Ticket Office, adjoining the Washington Railroad Ticket Office, Pratt Street, Baltimore* STOCKTON & FALLS.

October, 1849.

ST. LAWRENCE & ATLANTIC RAILROAD COMPANY.

Notice is hereby given that the Trains run twice per day between Montreal and St. Hyacinth, leaving each terminus alternately, until further notice.

Leaving St. Hyacinth at - - 7 am.
" " - - 3 pm.
Leaving Montreal at - - 10 am.
" " - - 6 pm.

THOMAS STEERS, *Secretary.*

May 31, 1849.

WESTERN AND ATLANTIC RAILROAD, FROM ATLANTA, GA., TO CHATTANOOGA, TENN. 140 Miles.

PASSENGER SCHEDULE.

Leave Chattanooga daily, Sundays excepted, at 8½ a.m.
Arrive at Kingston . . . by 12 m.
" Dalton . . . by 3 p.m.
" Chattanooga . . . by 6 "
Leave Chattanooga daily, Sundays excepted, at 7 a.m.
Arrive at Dalton . . . by 9½ "
" Kingston . . . by 12 m.
" Atlanta . . . by 4 p.m.

The fare is now permanently reduced to *three* cents per mile for way as well as through Passengers; children and servants *two* cents per mile.

There are two Railroad routes from Atlanta to the Seaboard, viz: one by the Georgia Railroad to Augusta, and thence to Charleston by the South Carolina Railroad; the other by the Macon and Western Railroad to Macon, and thence to Savannah by the Central Railroad.

At Kingston, 60 miles north of Atlanta, the Rome Railroad branches off to Rome on the Coosa river, which admits of steamboat navigation as far down as Greensport in Ala. Mail stages are in operation from Rome leading towards Tuscaloosa, Ala., Columbus, Miss., Memphis, Tenn., etc.

At Dalton, 100 miles north of Atlanta, a line of stages branches off to Knoxville, Tenn., which will be superseded by the East Tennessee and Georgia Railroad as rapidly as the same is completed.

At Chattanooga a number of steamboats are in successful operation on the Tennessee river, and from that terminus of the road stages run to Nashville, which will be superseded by the Nashville and Chattanooga Railroad as rapidly as the same is completed.

WM. D. FULLTON, Supt. Transp.
Transportation W. & A. R. R., }
Atlanta, March, 1850. }

CAR MANUFACTORY
CINCINNATI, OHIO.

KECK & DAVENPORT WOULD RESPECTfully call the attention of Railroad Companies in the West and South to their establishment at Cincinnati. Their facilities for manufacturing are extensive, and the means of transportation to different points speedy and economical. They are prepared to execute to order, on short notice, Eight-Wheeled Passenger Cars of the most superior description. Open and Covered Freight Cars, Four or Eight-Wheel Crank and Lever Hand Cars, Trucks, Wheels and Axles, and Railroad Work generally.

Cincinnati, Ohio, Oct. 2, 1848. 44tf

FOWLER M. RAY'S
METALLIC INDIA RUBBER CAR SPRINGS.

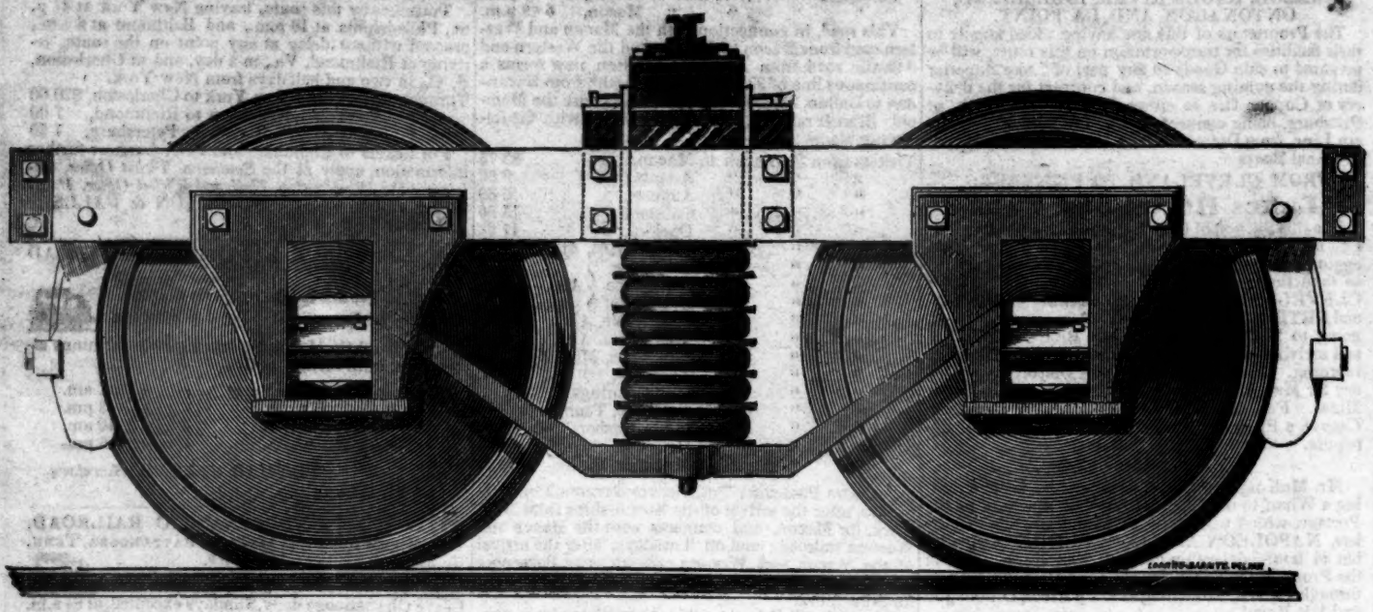


Fig. 1.

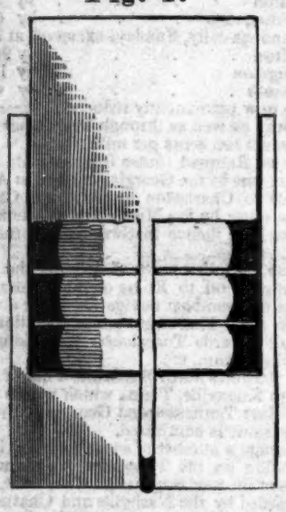


Fig. 2.

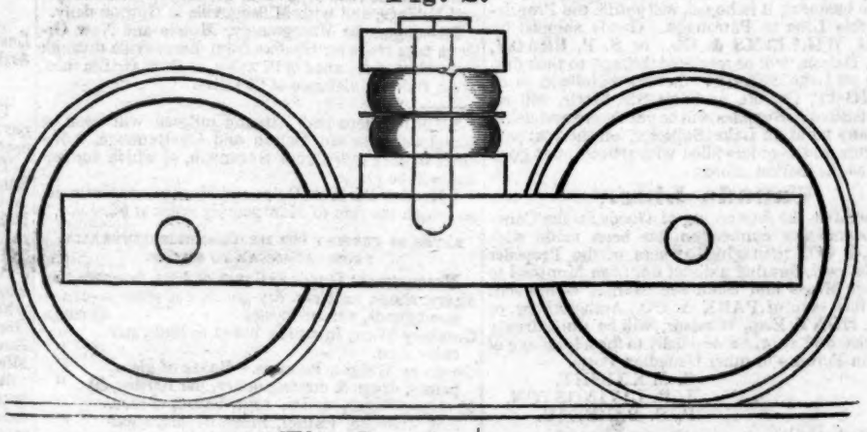
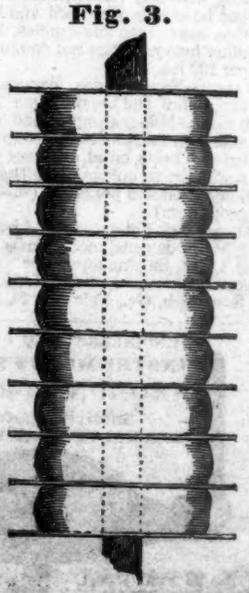


Fig. 3.



So much has been published for the purpose of misleading the public in regard to the inventorship of the India-rubber Railroad Spring, patented in the United States by Mr. W. C. Fuller, that the New England Car Company, proprietors of this invention, have deemed it proper, for the information of Railroad Companies, Car Builders and the public generally, to lay before them the facts upon which they found their claim to this invention, and to a Patent therefor.

Cut No. 1, Represents a cross section of the first model made by Mr. Tucker, under the direction of Mr. Ray, in the summer of 1844, and to which Mr. Tucker, Mr. Bradley and Mr. Bannester testify as being the model marked "B."

Cut No. 2, Represents the model made in 1845, to which Mr. Osgood Bradley and Gen. Thos. W. Harvey have testified.

Cut No. 3, Represents a rough sketch made by Mr. Ray in 1844, which he gave to a man about departing for England to take out some patents, who promised to write to Ray after his arrival in that country—which promise he has probably forgotten.

Mr. W. C. Fuller, of England, patented the above Spring in that country on the 23d October, 1845. He filed his enrollment April 23d, 1846, and on the 22d October, 1846, he took out a patent in the United States under the title, "For Improvement in Railway Carriages," when the improvement consisted in the spring, and not in the carriage.

The reader will perceive by the annexed testimony, that the India-rubber Railroad Car Spring was invented by Mr. Ray about two years previous to the date of Mr. Fuller's enrollment.

The Depositions are omitted for want of room, but will be published in full in the course of a few weeks.

AMERICAN RAILROAD JOURNAL.
PUBLISHED BY J. H. SCHULTZ & CO.
ROOM 12, THIRD FLOOR,
No. 136 Nassau Street,
NEW YORK.

TERMS.—Five Dollars a year, *in advance.*

RATES OF ADVERTISING.

One page per annum	$200 00
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One page per month	25 00
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One square "	3 00
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☞ LETTERS and COMMUNICATIONS to this Journal may be directed to the *Editor*

HENRY